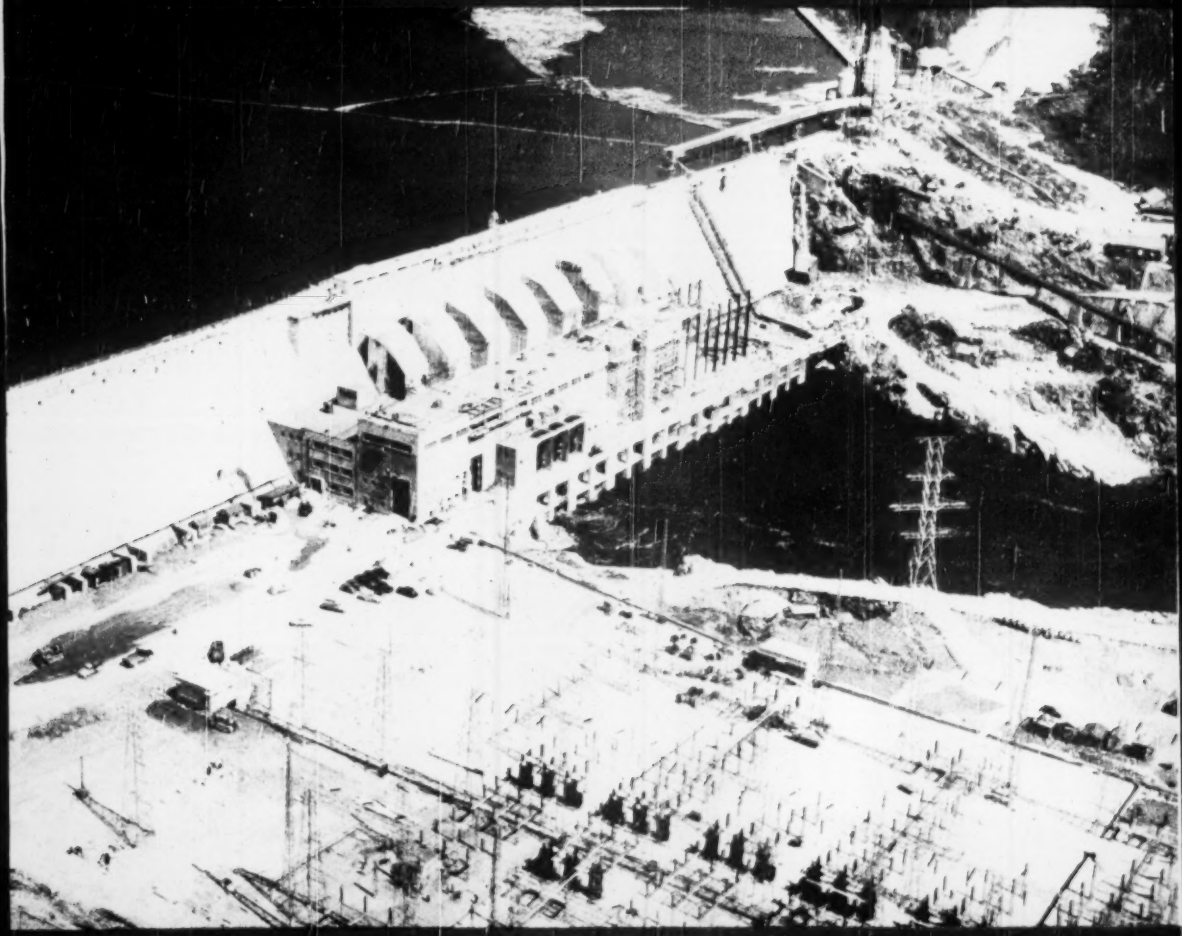
# ENGINEERING NEWS-RECORD

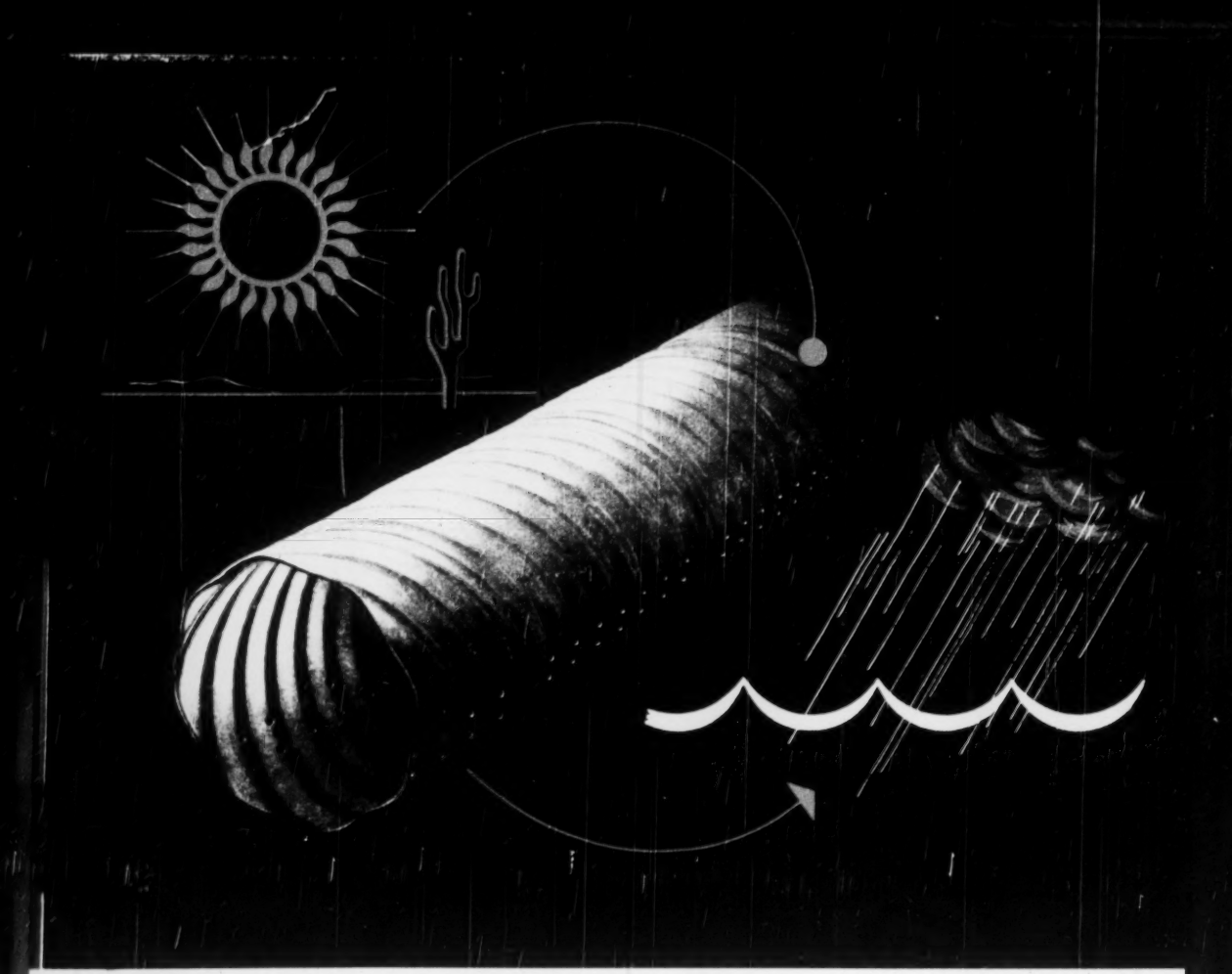
SEVENTY-SIXTH YEAR OF PUBLICATION



★ WOOD FORMS CUT COSTS

★ RECLAMATION RESEARCH

A McGRAW-HILL PUBLICATION



# They stopped a flood on dry land

Flooded subgrades often caused heavy maintenance expense on highways, airports and railways, even when the surface was dry as a bone.

To remove this excess water permanently and economically Armco engineers developed HEL-COR Perforated Pipe.

Made on automatic machines, this pipe meets all the needs of a first class subdrainage system. It is low in cost, easy to handle, and durable. It has ample corrugated metal strength to withstand shifting soils, frost action or the impact and vibration of heavy loads. Scientifically placed holes collect unwanted water, which is drained off along the pipe invert. Subgrades become dry and stable; maintenance costs go down.

Providing better products to meet specific needs has been standard practice at Armco for more than 40 years. A few examples are Spiral Welded Pipe, FLEX-BEAM Guardrail, STEELOX Buildings and MULTI-PLATE Bridges.

Today you can bring your drainage and construction problems to Armco with full assurance that you will receive all the benefits of long experience, extensive research facilities and a real interest in helping you solve these problems.

Armco has a complete range of engineered products and convenient, authoritative data to help you. If your problem is difficult or unusual, why not talk it over with us.

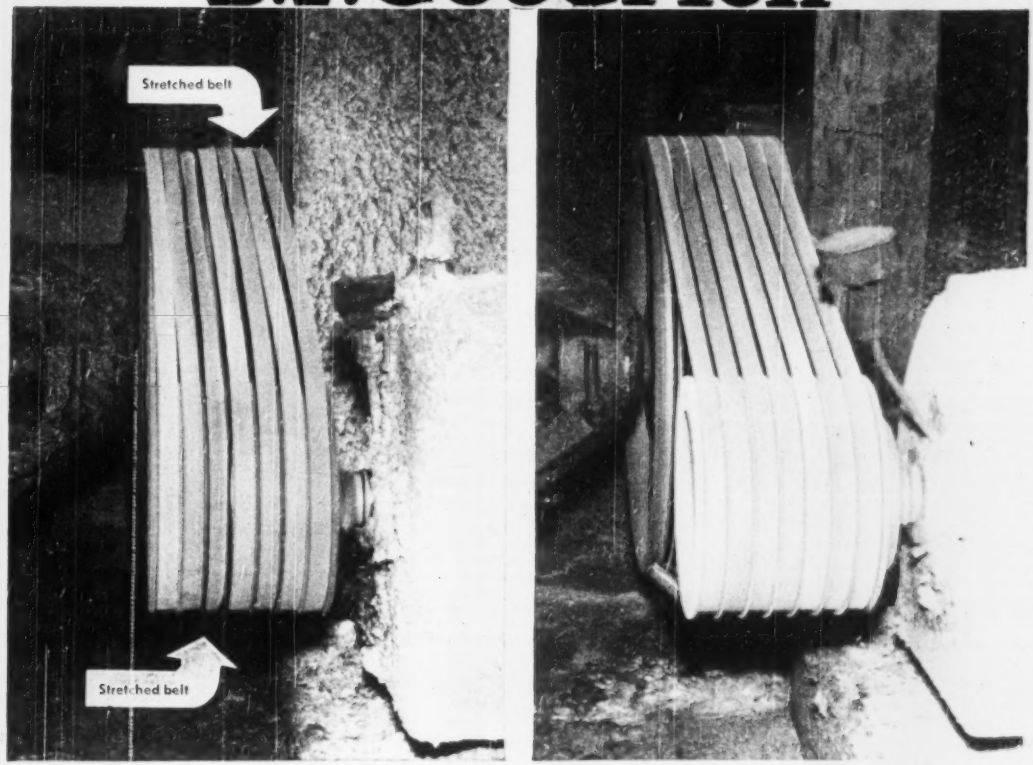
ARMCO

## ARMCO DRAINAGE & METAL PRODUCTS, INC.

**MIDDLETOWN, OHIO • OFFICES AND PLANTS IN PRINCIPAL CITIES**
**SUBSIDIARY OF ARMCO STEEL CORPORATION**

**Berkeley, California ★ Middletown, Ohio ★ South Bend, Indiana ★ Baltimore, Maryland Denver, Colo. ★ Des Moines, Iowa ★ Atlanta, Ga. ★ Topeka, Kansas ★ Houston, Texas Minneapolis, Minnesota ★ Portland, Oregon ★ Washington, D. C. ★ Guelph, Ontario**

# B.F.Goodrich




## One of these drives is wasting money — the other has grommet V belts

*B.F.Goodrich grommet V belts cut costs 20 to 50%*

BOTH of these drives are in the same plant, do the same work, get the same maintenance. When first installed, both were equipped with ordinary belts. But within a few days the belts had stretched so much the motor had been moved to the end of the slide rails. Ordinary belts were tried again, but they still stretched, even more so. The photo at *left* shows how the belts looked — loose, permanently stretched, over-riding each other.

Then B.F.Goodrich grommet V belts were put on both drives. After six months of 24-hour-a-day service, they haven't stretched at all, as the photo at right shows. Here are the reasons:

*Twin grommets* — The B.F.Goodrich grommet is made by winding heavy cord upon itself to form an endless loop. These grommets are placed close to the driving faces of the belt, make up the load-carrying section. No fabric plies to stiffen and build up heat. The B.F.Goodrich grommet V belt is more elastic, has less permanent stretch than any other V belt.

*Grommets work all the time* — In an ordinary belt much of the cord strength is lost, wasted in the center of the belt where the cords don't pull their share of the load. But in the grommet belt there are no center cords to lose. The grommets do the work, stay at it all the time.

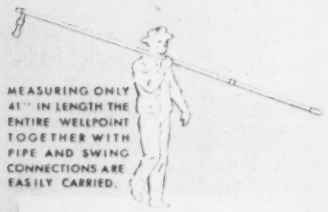
*Grommets last longer* — Laboratory and field tests show grommet V belts last 20 to 50% longer. Cause of most belt failures is eliminated by the grommets that replace overlapping cord plies.

The twin grommet construction is a result of B.F.Goodrich research (U.S. Patent No. 2,253,294). No other V belt is a grommet V belt. Presently made in D and E sections only.

A special demonstrator "X-ray" belt has been made to show the grommet construction. Ask your local BFG distributor to bring it around. *The B.F.Goodrich Company, Industrial and General Products Division, Akron, O.*

Grommet V Belts BY
**B.F.Goodrich**

dewater
the
Complete
way



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When you strike bad water conditions unexpectedly call "Complete"! We're ready for emergencies—with the experience to supervise, the personnel to service, and the patented fluted tube Wellpoint to solve the worst of wet water conditions. Wherever it is possible to operate wellpoints, only "COMPLETE" gives Complete assurance of Complete success!

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SYSTEMS

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# ENGINEERING NEWS-RECORD

Member ABP Member ABC

Volume 145 JULY 20, 1950 No. 3

Warren G. Bowman
Editor

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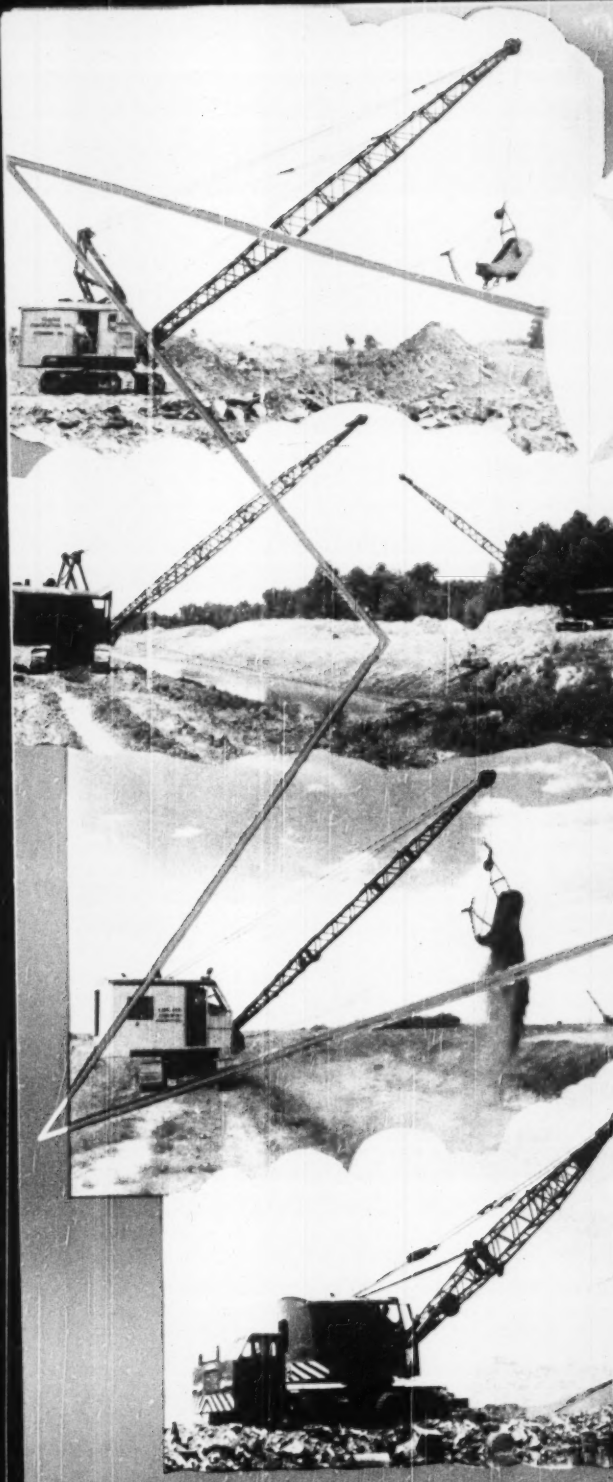

# The star performer on every dragline job!

What size Dragline job? How much travel? What size ditch—how much overburden—how much reach—how much output? The Northwest range of Dragline Capacities and features of design give you the greatest combination of advantages of any equipment of this type on the market. You'll find the Northwest Crawler capable of more miles of travel—without trouble. Positive traction on both crawlers while turning as well as when going straight ahead—a feature of the larger Northwests—minimizes the need for mats with big machines.

The "Feather-Touch" Clutch Control gives easy operation without the complications of delicate mechanism and needs no service specialists to take care of it. Uniform Pressure Swing Clutches give a smooth swing free from jerks and grabs that strain man and machine. The Cushion Clutch eliminates the shock overloads before they can damage machinery. Easy upkeep assures better care and smoother operation. These and other Northwest advantages make dragline jobs smoother running and assure greater profits.

Remember, your dragline is generally well off the beaten path. You can't afford anything but the best and if you have a Northwest you have the Star performer on any Dragline job. There is a size for every problem.

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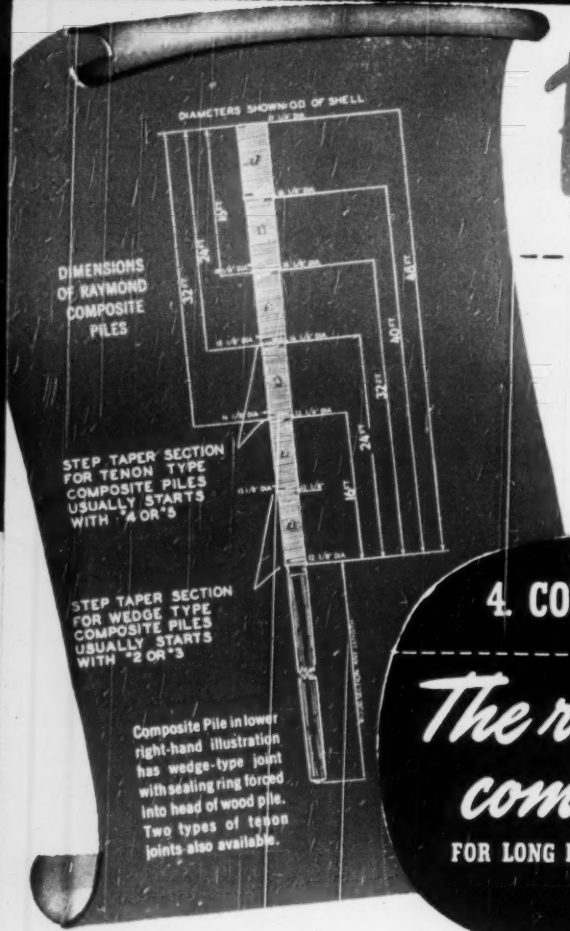
NORTHWEST

# Raymond MAKES 5 TYPES OF CONCRETE PILES

1. STANDARD . . . 2. STEP-TAPER . . .
3. PIPE STEP-TAPER . . . 4. COMPOSITE
5. GOW CAISSONS

Raymond installs every type of pile: cast-in-place concrete, precast concrete, steel pipe, wood and H-beam. Raymond operations include underpinning, borings and soil investigations, waterfront construction and harbor and river improvements; also cement mortar lining of pipes by the Centriline Corporation, a Raymond Subsidiary.

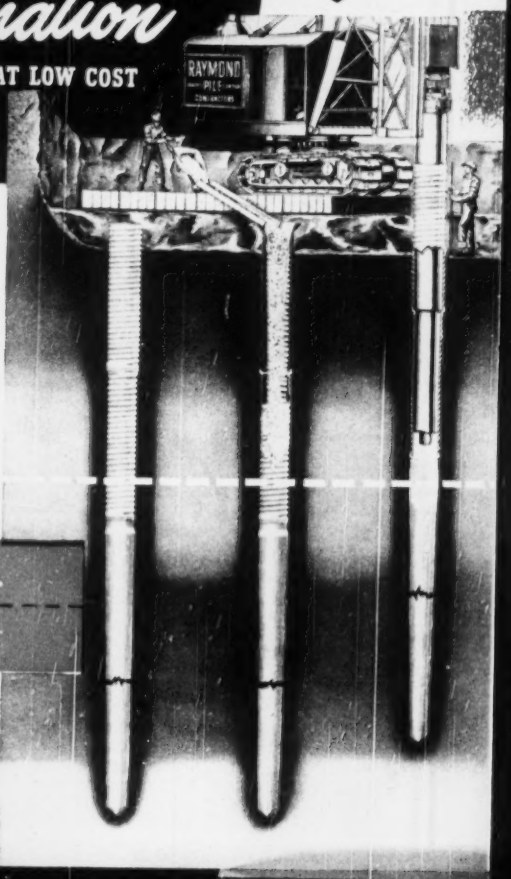

DIAMETERS SHOWN OD OF SHELL
DIMENSIONS OF RAYMOND COMPOSITE PILES
STEP TAPER SECTION FOR TENON TYPE COMPOSITE PILES USUALLY STARTS WITH #4 OR #5
STEP TAPER SECTION FOR WEDGE TYPE COMPOSITE PILES USUALLY STARTS WITH #2 OR #3
Composite Pile in lower right-hand illustration has wedge-type joint with sealing ring forced into head of wood pile. Two types of tenon joints also available.

## 4. COMPOSITE PILES

## *The right combination*

FOR LONG LENGTH AT LOW COST

*Right, driven wood pile is being followed down by pile shell of concrete section. Center, complete pile driven to resistance, pile shell is being filled with concrete. Joint, wedge-type with sealing ring, is below ground-water level. Completed pile is shown at left.*




Raymond Composite Piles are used for economy and long length. The concrete upper section extends from the permanent water table up to the underside of the footing, thus eliminating the expensive excavation, sheeting and pumping often required with wood piles.

Raymond Composite Piles have solved many deep foundation problems permanently and at minimum final cost. We shall be glad to advise you, without obligation, whether they are suitable for your project.

PERMANENT WATER LINE

RAYMOND PILES MAINTAIN DRIVING RESISTANCE

**Raymond CONCRETE PILE CO.**

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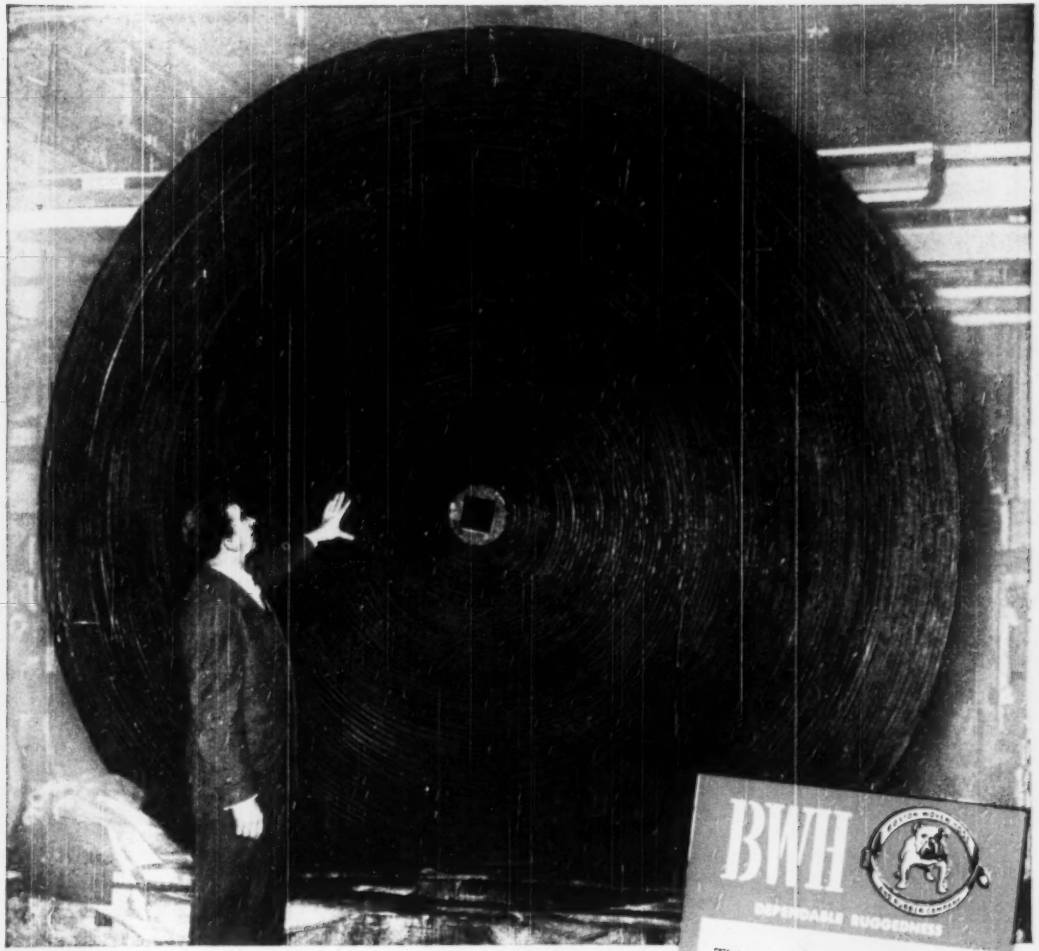
*BRANCH OFFICES*: Boston, Syracuse, Philadelphia, Baltimore, Washington, Pittsburgh, Atlanta, Miami, Houston, Kansas City, St. Louis, Cleveland, Chicago, Detroit, Salt Lake City, Portland, San Francisco, Oakland, Los Angeles and principal cities in Latin America.



# Huge *one piece* BWH Belt

## DESIGNED TO CUT WASTE LINES!

When BWH engineers were called on to produce a fast, power-saving, economical belt for a coal mine, this 15-ton Silver King ROTOCORD BELT was the result. It's one of the largest one piece conveyor belts ever produced. Made by the famous, exclusive BWH ROTOCURE Process of continuous vulcanization, this giant is 1576 feet long, 48 inches wide. It will haul better than 500 tons an hour on a rugged grade at the fast clip of 400 feet per minute. Maintenance worries are lessened by the absence of splices. It's another top performance by BWH . . . leaders for 71 years in the manufacture of mechanical rubber goods of dependable ruggedness for use in all industries.

Bring us your toughest problems. We're specialists in solving them. Consult your nearest BWH distributor or write us direct.

BWH
DEPENDABLE RUGGEDNESS
This is the ROTOCURE Process of continuous vulcanization, exclusive with BWH. It does away with the 30 to 40-foot overlaps occurring in the duck carcass in old-fashioned flat-press curing, eliminates the possibility of operational weakness caused by such overcuring.
Cured Belt
Continuous Uniform Cure
Continuous Uniform Stretch

Another Quality Product of

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# DIRT SEALED OUT! BEARINGS LAST LONGER

Dust, mud, moisture—they can't get into bearings protected with tough, tenacious *Texaco Marfak!* Protection is twofold. Inside the bearings, *Texaco Marfak* maintains a fluid, wear-resisting, lubricating film. At the bearing edges, it retains its original consistency — forming a "collar" that seals the lubricant in, seals contaminants out.

*Texaco Marfak* affords protection against rust and wear . . . assures fewer repairs and replacements . . . reduces maintenance costs. In addi-

## . . . when lubricated with TEXACO MARFAK

TEXACO

tion, *Texaco Marfak* far outlasts ordinary chassis grease. Fewer applications are needed.

In wheel bearings, you get this same cost-saving protection by using *Texaco Marfak Heavy Duty*. Bearings last longer . . . and its self-sealing property assures safer braking. No seasonal change is required.

### Two other maintenance savings

Upkeep costs for engines — heavy-duty gasoline or Diesel — come down when you lubricate with *Texaco Ursa Oil X***. It cleans as it lubricates . . . helps reduce fuel consumption.

Crawler track mechanisms run better, last longer and cost less for maintenance when lubricated with *Texaco Track Roll Lubricant*. It seals dirt and moisture out of bearings even under severe conditions.

Find out how Texaco top-quality lubricants and the Texaco Simplified Lubrication Plan can help your machinery do more work at lower cost.

Just call the nearest of the more than 2,000 Texaco Wholesale Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

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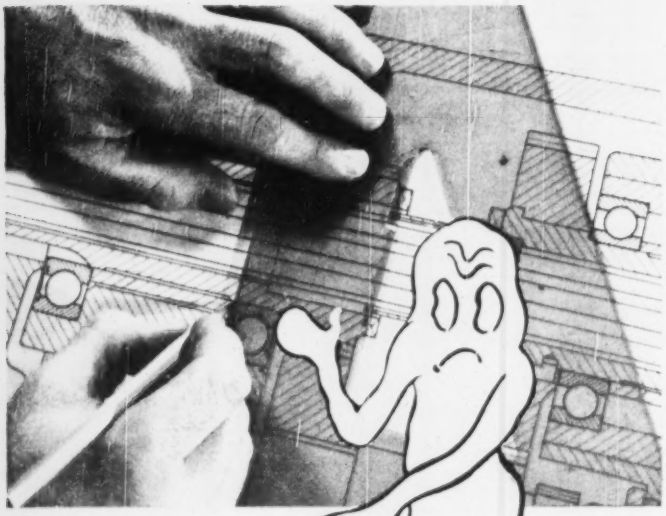
# Lubricants and Fuels

**FOR ALL CONTRACTORS' EQUIPMENT**



Ever been haunted by an "ERASURE GHOST"?

The beauty of Arkwright Tracing Cloth is its *permanent* translucency — built all the way through the cloth by a special process. Arkwright will take the heaviest erasures without "ghosting". You can count on clear, clean prints from drawings on Arkwright cloth years after you make them.

You can re-ink over erasures on Arkwright Tracing Cloth without feathering or "blobbing". You can be sure there are no pinholes, thick threads or other imperfections in the cloth to bother you. Every roll is carefully inspected before leaving the factory.

Think a moment. Isn't it an unnecessary risk to put your important drawings on inferior tracing cloth or paper? A sample will show you the difference. Write Arkwright Finishing Company, Providence, R.I.

ARKWRIGHT
*Tracing Cloths*

AMERICA'S STANDARD FOR OVER 25 YEARS

## NEWS BRIEFS

**Why Bother?**—Blaw-Knox Co. has a contract for a 200-ft TV tower to be erected on a five-story building in Cuba. The tower is designed to handle what's believed to be the heaviest load any tower of similar height has ever been called on to bear. With Cuba in the hurricane belt, B-K engineers designed it to resist a 200-mph wind pressure, a strength which may also withstand some of the programs.

**Cleaner Fruit Too?**—Old-style smudge pots must go from Los Angeles County's citrus groves by next winter. County supervisors ordered that growers meet regulations of the Air Pollution Control District. That'll mean modification of about 675,000 heaters, replacement of about 211,000 more. They'll have to pass a test limiting smoke emission to 1 gram per minute.

**Cleanup Coming**—St. Louis is about ready to spend $40,000 on surveys of blighted areas to help in the enforcement of its minimum-housing standards ordinance.

**Power Politics**—Reports that Pacific Northwest governors might try to head off a Columbia Valley Administration by an interstate compact dividing water and power resources of the Columbia River brought a warning from the Puget Sound Public Utility District that it would oppose such a move. In any event, the PUD asserted, its preferential rights in the sale of federally generated power from the river should be protected. PUDs feel they might lose their preference if non-public power states dominated such a compact.

**BPR Won't Like It**—A western New York state group proposes a 175-mi, 65-mc toll road to connect Buffalo and Pittsburgh, connecting with the Pennsylvania Turnpike. Federal aid would be required for construction.

**Go West, Young Rainmaker**—Northern Arizona cattlemen have contracted for rainmaking in a 2,000 sq mi area at $4 per sq mi. Precipitation Control Co., of Phoenix, guarantees to double the area's rainfall, using vaporized silver iodide and calcium chloride dispensed by planes and ground generators.

**It Can Happen**—Canadian officials have been wondering how to correct an eight-in. error in the foundation of a $4,000,000 building being erected

(Continued on page 10)

# JENKINS PRACTICAL PIPING LAYOUTS 50

| CODE | QUAN. | JENKINS VALVES | SERVICE |
|---|---|---|---|
| A | 1 | Fig. 92 — Bronze Sw. Check | Prevent System Backflow to Water Supply |
| B | 1 | Fig. 47 — Bronze Gate | Water Supply to Closed System |
| C | 1 | Fig. 47 — Bronze Gate | System Connection to Expansion Tank |
| D | 1 | Fig. 92 — Bronze Sw. Check | Prevent Reverse Flow to Pump |
| E | 1 | Fig. 106 A — Bronze Globe | Pump Discharge Regulation |
| F | 2 | Fig. 47 — Bronze Gate | Heat Exchanger Shut-off |
| G | 1 | Fig. 106 A — Bronze Globe | Flow Control to Individual Cooling Coils |
| H | 1 | Fig. 47 — Bronze Gate | Warm Water Return Shut-Off |
| I | 1 | Fig. 47 — Bronze Gate | Pump Suction Shut-off |
| K | 1 | Fig. 106 A — Bronze Globe | Drain Valve |
| L | 1 | Fig. 106 A — Bronze Globe | Pressure Gauge Control |
| M | 1 | Fig. 106 A — Bronze Globe | Air Column Release |
| N | 1 | Fig. 106 A — Bronze Globe | Pump Vent |

## CLOSED EXPANSION TANK PIPING CONNECTIONS

**To provide for changes** in system water volume (due to water temperature variations), an expansion tank is used in water heating or cooling systems. The tank may be of the open, vented or (as illustrated) closed type. The latter has the advantage, in that it can be located anywhere in the system. Layout shows it tied into discharge side of circulating pump.

**Supply valve is left open** throughout filling operation. Water fills entire system compressing the air in expansion tank. When tank pressure equals that of supply water, the supply line check valve closes automatically.

**As system water cools** and contracts, pressure drops below that of supply water, opening check valve until pressures equalize. Should system water temperature rise too high, a relief valve opens, draining water back into tank, compressing the air to above water supply pressure. A check valve prevents water flow back into supply line.

Consultation with accredited piping engineers and contractors is recommended when planning any major piping installations.

### A CHOICE OF OVER 500 VALVES

To save time, to simplify planning, to get all the advantages of Jenkins specialized valve engineering experience, select all the valves you need from the Jenkins Catalog. *It's your best assurance of lowest cost in the long run.*

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NEW BOOK of PIPING LAYOUTS — Nos. 26 to 50

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### VALVE RECOMMENDATIONS

For details and valves to suit varying conditions see Jenkins Catalog

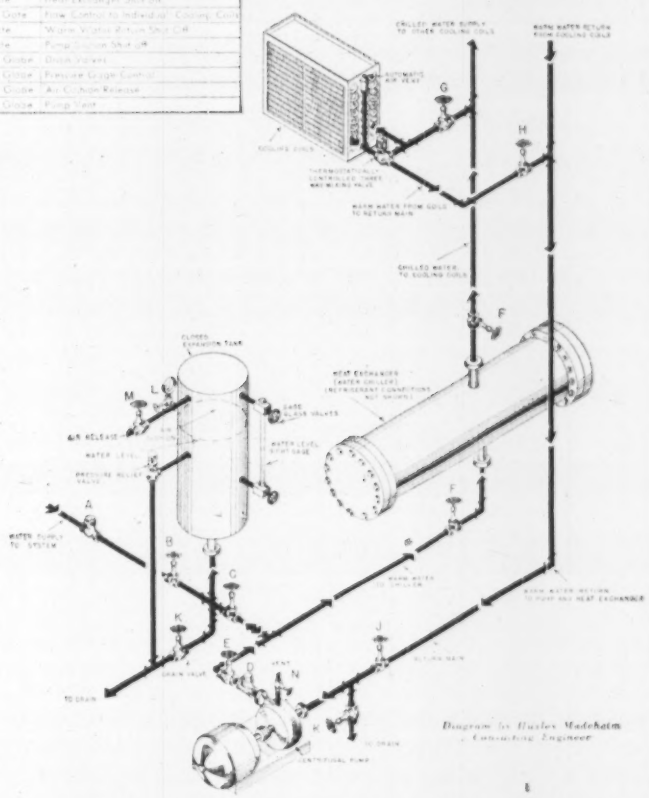



*Diagram by Hunter Madeheim, Consulting Engineer*

JENKINS
LOOK FOR THE DIAMOND MARK
VALVES SINCE 1864

*Hotel Dieu Hospital—Beaumont, Texas*
*Fire Safe with "Automatic" Sprinklers*

If fire protection measures are warranted in commercial and industrial structures where dollars are at stake, how much more necessary is every possible safeguard in buildings where helpless lives are constantly in jeopardy?

No building with flammable contents, regardless of construction, is *fireproof*. Only through the installation of *"Automatic" Sprinklers* can a structure be made *fire safe*. *"Automatic" Sprinkler's* record of better than 99% fire extinguishing effectiveness is all conclusive.

You and every other executive with an appreciation of good business logic must not overlook the importance of absolute fire safety, for you can *save lives . . . save property and save money with "Automatic" Sprinklers*.

"AUTOMATIC" SPRINKLER CORPORATION OF AMERICA

*"Automatic" Sprinkler*

FIRST IN FIRE PROTECTION

OFFICES IN PRINCIPAL CITIES OF NORTH AND SOUTH AMERICA

(Continued from page 8)

in Ottawa by the Dominion for its Department of Veterans Affairs. It's that far out of line on city property. Discovery followed placing of concrete for the basement, when the contractor for the superstructure made his own survey before beginning his work. It's expected that blasting, new excavation and concrete work will be required to get the block long basement where it belongs.

**Fight Water With Water**—Orange County, Calif., water district has been buying surplus water from Hoover Dam and sinking it in wells to halt salt water incursion. Tests showed existing water wells would be contaminated by next year if the present rate of incursion is maintained. Experiments are underway to treat sewage water so it may be sunk in the ground, rather than discharged into the sea. As many as 2,000,000 gal daily might be so reclaimed.

**Railroads, Keep Off**—Rail traffic over the Interprovincial bridge across the Ottawa River between Ottawa and Hull, Que., has been suspended as a result of a "sag" detected in one of the steel spans. Neither bus nor automobile traffic was halted while repairs were made.

### THE COVER

On three consecutive Wednesdays in June, three new hydro plants went into service in Ontario with a total of 216,000 hp badly needed by the power-short province. It was a big month for the Hydro-Electric Power Commission of Ontario—and it came just in time for inspection by ASCE members in session at Toronto. (See also news pages.)

Largest of the three is the Des Joachims project. On June 28, two of its ultimate eight 60,000-kw units started generating. This $76,000,000 project (ENR Feb. 9, p 32) is comprised of the main dam, power plant and auxiliary dam pictured on the cover, plus a 130-ft high control structure upstream where the Ottawa is diverted through McConnell lake.

The week before Des Joachims, it was Pine Portage on the Nipigon River initially delivering 40,000 hp where 160,000 hp eventually will be produced. And on June 14, the Tunnel project on the Mississagi River led off with its full 56,000-hp output.

By the end of next January, Ontario Hydro will have another 460,000 hp in its system: 360,000 more from Des Joachims; 40,000 more from Pine Portage; and 60,000 hp from Chenaux, 60 miles downstream from Des Joachims.

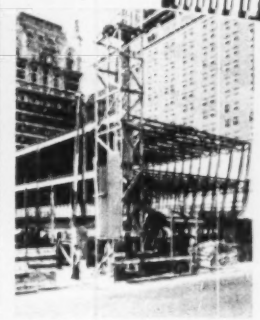
TRUSCON
MARK OF MERIT PRODUCTS

# TRUSCON "Clerespan" Joists

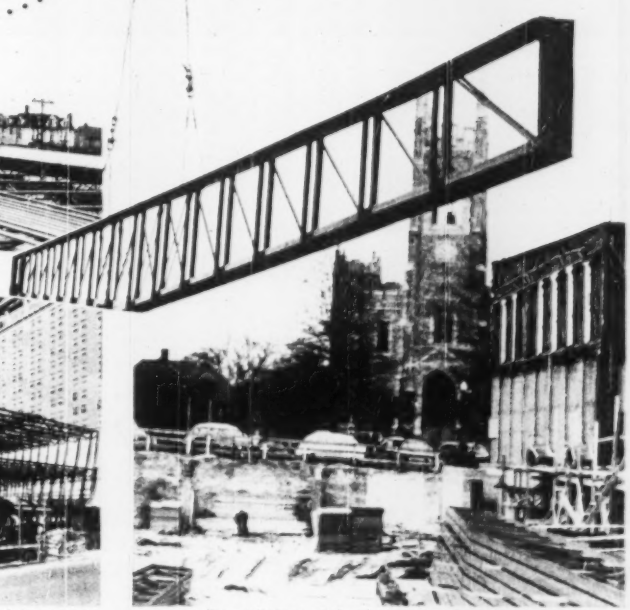
## *Long* on length...

"Truscon" Fireboard" Steeldeck being used with "Clerespan" Joists for ideal, fire-resistant roof construction.

Truscon "Clerespan" Joists in Heindel Oldsmobile Garage, Youngstown, O.



Truscon "Clerespan" Joists used in Adolphus Garage, Dallas, Texas.



"Truscon" Clerespan" Joists were used to obtain large unobstructed areas in the Star Market, Neutonville, Mass.

## *short* on costs

Impart a sweeping new airiness to your structures...endow them with spacious floor areas unobstructed by intermediate supporting columns or pillars. Plan with Truscon "Clerespan" Joists, and get up to 80-foot clear reaches with adequate safety. Long spans such as these permit more efficient arrangement of partitions, display counters, stocks, machinery, etc., and make possible the development of large, free, floor expanses for garages, bowling alleys and similar requirements. The number of structural elements required is substantially reduced. The shallow depth of "Clerespan" Joists also permits a saving in masonry work by reducing the required height of building walls. Free illustrated literature on Truscon "Clerespan" Steel Joists sent on request.

FREE Book on Truscon "Clerespan" Joists. Write for it. The Truscon Steel Company Manufactures a Complete Line of Steel Windows and Mechanical Operators . . . Steel Joists . . . Metal Lath . . . Steel-deck Roofs . . . Reinforcing Steel . . . Industrial and Hangar Steel Doors . . . Bank Vault Reinforcing . . . Radio Towers . . . Bridge Floors.

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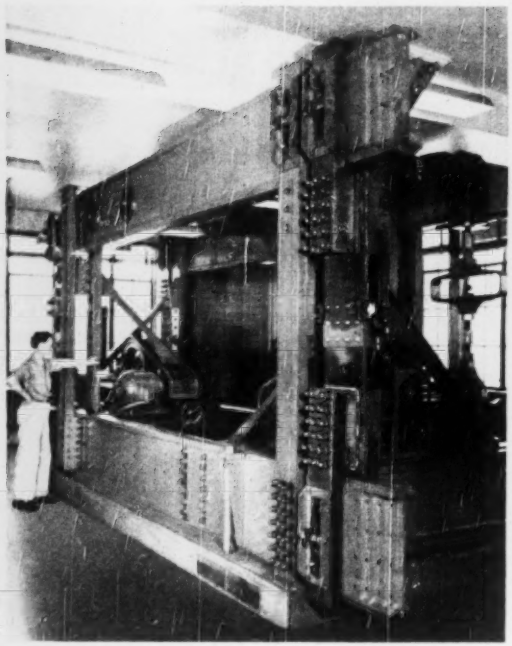

# BETTER JOINTS... for Making Better Buildings

Superior fatigue strengths and smaller slippages are obtained in structural joints fastened with high-carbon bolts . . . according to the fatigue tests shown above.

These tests have been conducted by the Northwestern Technological Institute under the auspices of the Industrial Fasteners Institute.

The results of tests such as these indicate the advantages of using bolts in structural connections. To keep up-to-date with this important trend in construction, write RB&W for a copy of the report entitled, "The Effect of Various Fasteners on the Fatigue Strength of a Structural Joint".

Jack Allan is checking the atmosphere in one of RB&W's modern heat-treating furnaces. It is a process which insures the greatest control of strength and toughness for fastening jobs where high stresses will be encountered.

In this furnace a chemically controlled atmosphere continuously bathes the work, preventing the formation of objectionable scale. Equally important, it prevents any loss of carbon from the fastener surface during heat treatment.

Thus Jack, along with hundreds of other RB&W craftsmen (many of them second and third generation in the company), helps to develop the desired combination of properties demanded for various types of building jobs.

**RB&W**

**The Complete Quality Line**

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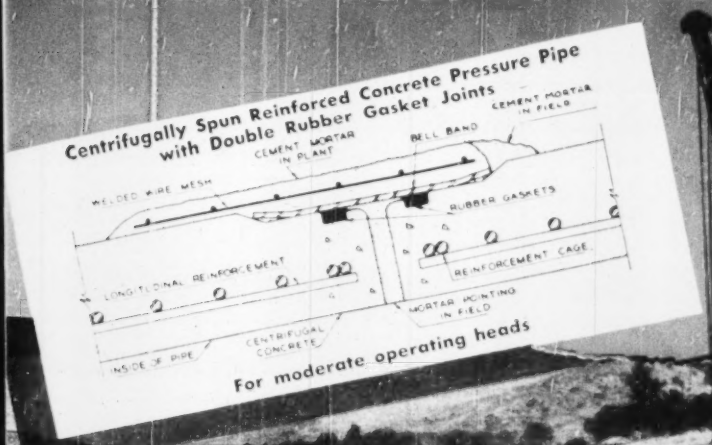
Plants at: Port Chester, N. Y., Coraopolis, Pa., Rock Falls, Ill., Los Angeles, Calif. Additional sales offices at: Philadelphia, Detroit, Chicago, Chattanooga, Oakland. Sales agents at: Portland, Seattle. Distributors from coast to coast.

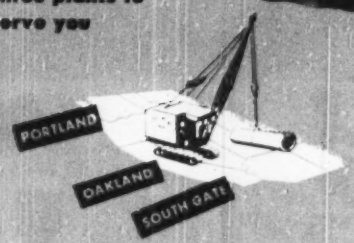
*105 Years Making Strong the Things That Make America Strong*

# SAVES IN COST OF DELIVERED WATER THROUGHOUT THE WEST




*Installation of 68" pipe in El Monte Pipe Line, Section IV, for City of San Diego, California.*

**Three plants to serve you**




## Typical Installations

1. **Pacific Gas and Electric Co., Kern Steam Plant, Bakersfield, California—2,050 Ft. of 48" to 72" for operating heads from 60 Ft. to 117 Ft.—1947.**
2. **Coachella Valley County Water District, Coachella, Calif. (U. S. Bur. of Reclamation Project), Units 5, 6 and 7—270,000 Ft. in sizes from 12" thru 72" and for operating heads up to 75 Ft., 1949-1950.**
3. **Olympia, Washington (McAllister Springs Water Supply Line) 35,000 Ft. of 36" pipe for maximum 150 Ft. operating head—1947.**
4. **San Diego County Water Authority (San Diego Aqueduct—Sweetwater Extension) 23,500 Ft. of 18"—24" pipe for operating heads up to 130 Ft.—1947.**
5. **Camp San Luis Obispo, California (U. S. Army) 49,000 Ft. of 24" pipe for heads up to 150 Ft.—1941.**
6. **City of Whittier, California—6,700 Ft., 21" and 30" pipe for heads of 50 Ft.—1949.**

## INSTALLATIONS NOW TOTAL NEARLY ONE MILLION FEET

There are five basic reasons why this superior pipe helps reduce the cost of delivered water. They are: *low first cost, ease of installation, sustained maximum performance, freedom from maintenance, permanence.* These and other reasons account for installations throughout the Pacific area, from Canada to Mexico.

This pipe is another example of American's ingenuity and skill in the development of better products for water supply lines. Further information is available upon request.

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**PIPE AND CONSTRUCTION CO.**

Concrete Pipe for Main Water Supply Lines, Storm and Sanitary Sewers, Subaqueous Pipe Lines

**P. O. Box 3428, Terminal Annex • Los Angeles 54, California**

QUALITY PIPE LINE PRODUCTS MANUFACTURED AND INSTALLED BY AMERICAN INCLUDE HUME CENTRIFUGAL CONCRETE PRESSURE PIPE, AMERICAN CONCRETE CYLINDER PIPE, PRESTRESSED LOCK JOINT CONCRETE CYLINDER PIPE, LOCK JOINT CONCRETE CYLINDER PIPE, NON-PRESTRESSED

Main Offices and Plant—4635 Firestone Blvd, South Gate, California

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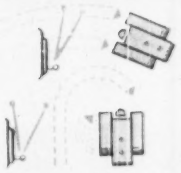
# CHAMPION

## the NEW

**Positive all-weather starting** on gasoline with quick change over to fuel diesel operation, all from the seat

**Instant speed change** [illegible] Planet Power drive [illegible]

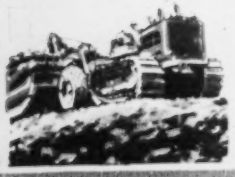
**Separate reverse lever** for quick change of direction. The tractor moves in the direction the lever is moved



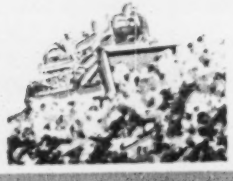
**Planet Power steering** [illegible] with power on both tracks. Feathered turns and pivot turns at your fingertips

## HERE ARE SOME OF THE CHAMPION'S EXCLUSIVE FEATURES

**Self load and run** [illegible]

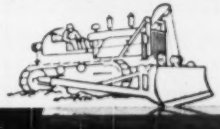


**Cut waste shifting time** [illegible]



**Work on grades up to 100%** [illegible]

**Handle heaviest loads** on gradual turns as easily as straightaway because both tracks are powered in the turn



## "There Is Nothing Like The TD-24. It Can Out-Push Any Tractor On The Job."

"Here is the Champion of Crawlers," owners will tell you, "the tractor that will pull down your dirt moving costs."

Contractors and operators who have observed or operated the new International TD-24 diesel crawler are spreading the news. Here is a tractor that out-works and out-performs every other crawler known to the industry!

Operators compete with each other from Florida to Alaska to get "the big red devils," the TD-24's, assigned to them. They'll tell you no other tractor can compare with the TD-24 for ease of operation or work capacity!

# of Crawlers
# INTERNATIONAL TD-24

Comfortable to ride, powerful, fast, safe and economical to operate, the TD-24 is revolutionizing ideas of what crawler tractors can or cannot do on the big jobs.

Regardless of what equipment you now use, visit your International Industrial Power Distributor and get a TD-24 demonstration. See for yourself what the TD-24 can mean to your operations in shortened time, reduced costs, extra profits.

**INTERNATIONAL HARVESTER COMPANY • Chicago**

INTERNATIONAL HARVESTER

## INTERNATIONAL INDUSTRIAL POWER

*Tune in "Harvest of Stars" with James Melton, Sundays, N. B. C.*

# Stands high with the crews that make the news

Men who work with wire rope on hazardous construction jobs and men who keep production humming inside a plant have one viewpoint in common. Both like the reassurance that rides hoists equipped with *Preformed* Yellow Strand. Your employees will feel the same way. Not only schedules but lives may hinge on any one of this rope's inbred qualities: responsiveness to the operator . . . reserve strength . . . resistance to kinking, whipping and fatigue.

The hoist line for a specific derrick or crane will be dependent upon the string-up, drum and sheave sizes, speed and other conditions. A general rule favors 6x19 or 6x37 *Preformed* Yellow Strand, regular lay, with fiber core for flexibility. If abrasion and drum crushing are factors, as on excavators, another construction may be indicated. Let your B & B distributor help you rig up with long-wearing *Preformed* Yellow Strand.

**Broderick & Bascom Rope Co., St. Louis 15, Mo.**

Branches: New York, Chicago, Houston, Los Angeles, San Francisco, Portland, Seattle Factories: St. Louis, Peoria, Houston, Seattle

**BRODERICK & BASCOM**

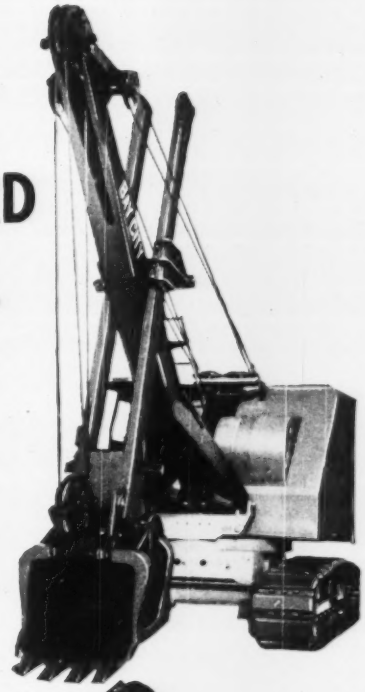
***Yellow Strand***

**PREFORMED WIRE ROPE**

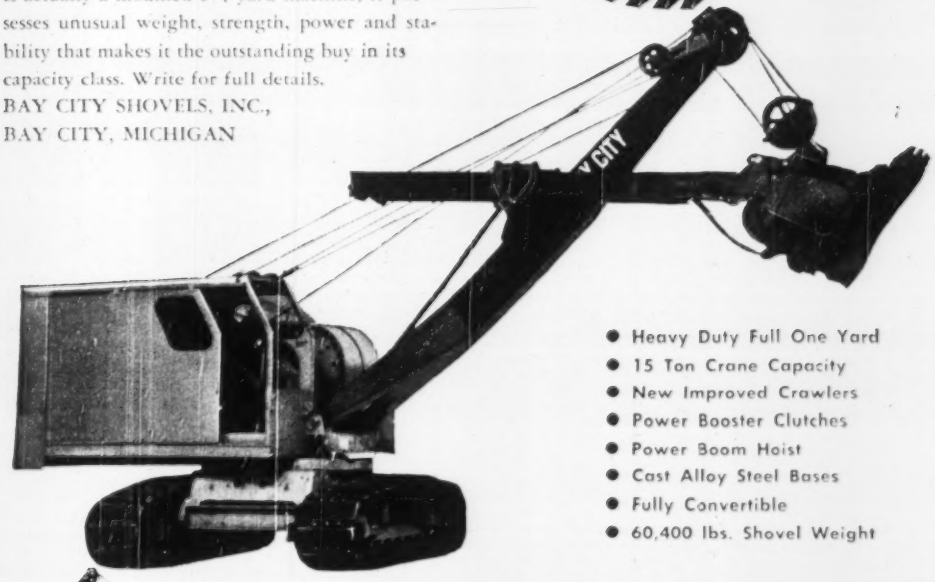
# MORE POWER— MORE WEIGHT—MORE STABILITY IN THIS 1 YARD CONVERTIBLE SHOVEL...

## the new

# BAY CITY MODEL 59



Because the new Bay City Model 59 one yard shovel is actually a modified 1¼ yard machine, it possesses unusual weight, strength, power and stability that makes it the outstanding buy in its capacity class. Write for full details.
BAY CITY SHOVELS, INC.,
BAY CITY, MICHIGAN



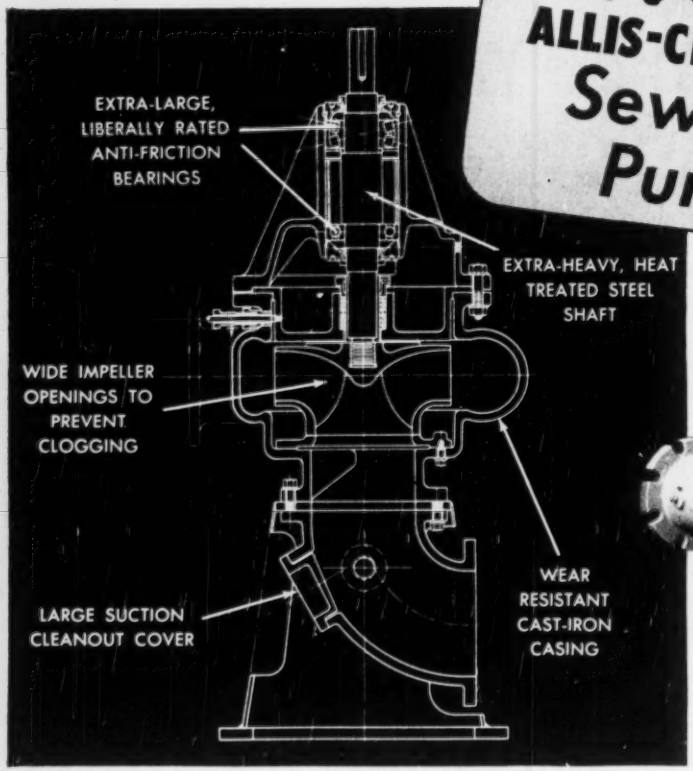
- Heavy Duty Full One Yard
- 15 Ton Crane Capacity
- New Improved Crawlers
- Power Booster Clutches
- Power Boom Hoist
- Cast Alloy Steel Bases
- Fully Convertible
- 60,400 lbs. Shovel Weight

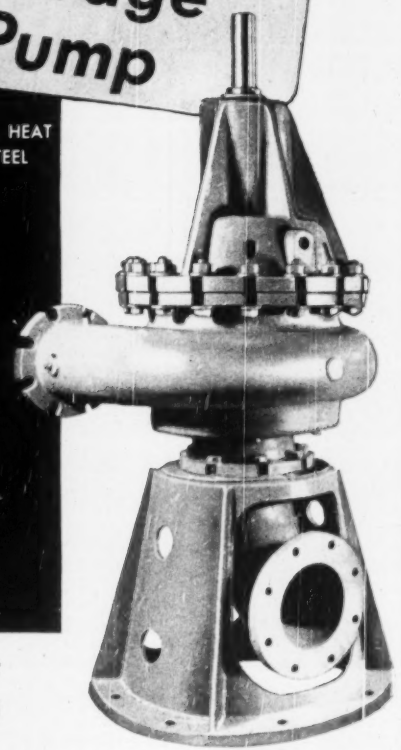
# BAY CITY

SHOVELS • CRANES • HOES • DRAGLINES • CLAMSHELLS

# ANNOUNCING..

## New ALLIS-CHALMERS Sewage Pump


EXTRA-LARGE, LIBERALLY RATED ANTI-FRICTION BEARINGS
EXTRA-HEAVY, HEAT TREATED STEEL SHAFT
WIDE IMPELLER OPENINGS TO PREVENT CLOGGING
WEAR RESISTANT CAST-IRON CASING
LARGE SUCTION CLEANOUT COVER



## EXTRA-HEAVY CONSTRUCTION OF NEW DESIGN GIVES LONG PUMP WEAR, LOW MAINTENANCE

A SURVEY among sewage works engineers showed what features they wanted most in this new sewage pump: (1) Ability to "take it" under tough service, (2) Continuous operating efficiency, (3) Easy maintenance. And here's how A-C built those features right into this new pump.

There's an extra heavy shaft—heavier than in ordinary sewage pumps. To prevent clogging, there's a generous liquid passage with rounded-off impeller inlets. For easy maintenance, the husky cast-iron casing is split radially so the complete rotating element can be removed. Simply drop out the universal coupling and loosen main bolts . . . takes only a few minutes.

Standard sizes to 10,000 gpm. Can be built larger. For complete details, write for Bulletin 08S7504.

ALLIS-CHALMERS, 1018A SO. 70 ST. MILWAUKEE, WIS.

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A-C is an Allis-Chalmers trademark

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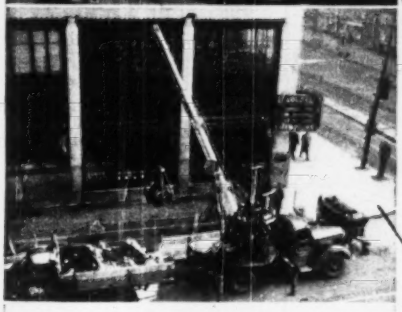
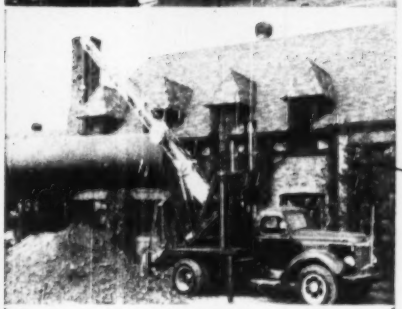
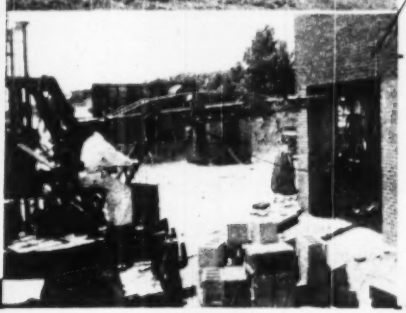
*World's Widest Range of Public Works Equipment*







# Special BUCYRUS ERIE HYDROCRANE Features Mean Extra Jobs, Extra Profits

CHECK these jobs — each had a special problem which was profitably answered through a special Hydrocrane feature. Check your own jobs. You'll find the Bucyrus-Erie Hydrocrane a real money maker for dozens of digging, lifting and material handling uses. Two sizes — ¼ yd. 2-ton H-2 and ⅝ yd. 3-ton H-3.

**BUCYRUS-ERIE HYDROCRANE DIVISION**
South Milwaukee, Wisconsin

**Speedy Travel and Compactness for Road Patching**

Here an H-2 Hydrocrane removes rubble on road patching work. With its fast road speed, this rig worked all over town. Also, its compact size allowed traffic to move freely.

**Precision Hydraulic Control for Close Quarter Digging**

This H-3 worked right next to an expensive plate glass window while digging a pit. Hydrocrane precision control has paid off on countless pipe, hydrant and valve handling jobs.

**Rubber-Tires Avoid Lawn Damage On Tank Setting**

No ripped turf or cracked driveway when the rubber-tired H-3 Hydrocrane handles this oil tank job. . . . A big reason why many owners like this crane for setting oil, gasoline, and septic tanks.

**Trash Bucket Speeds Land Clearing**

Variety of attachments is another feature. This owner finds the hydraulic trash bucket valuable for land clearing. Other units include magnet, hydraulic clamshell, catch basin bucket, 3-tine and multi-tine grapple.

**Telescoping Boom For Inside Digging**

With telescoping boom, this H-2 reached into the building and quickly cleaned out dirt and debris. This boom feature has won wide acclaim for digging near branches and wires.

**SEND THE COUPON FOR FULL DETAILS.**

**BUCYRUS-ERIE HYDROCRANE DIVISION**
South Milwaukee, Wisconsin

I want to know more about the profit making Hydrocrane.

Name .....

Company or Dept. .....

Address .....

City ..... State .....

66H50

# Ryerson Reinforcing... Delivered as Scheduled

Your reinforcing steels are always ready as needed when you use Ryerson reinforcing service. That's because your nearby Ryerson plant has ample facilities to meet fast schedules, and Ryerson deliveries are dependable.

There's no waiting for Ryerson reinforcing—nor is there large-tonnage dumping of future requirements. Piling up steel ahead of job progress means time wasted in sorting and rehandling. To prevent this, Ryerson deliveries are flexible—can be quickly adjusted for unforeseen construction delays. And if the job jumps ahead of schedule, we step up deliveries to keep pace.

Ryerson also offers the advantages of complete service from setting plans to steel on the site. Accurately fabricated bars are identified for easy placement with metal tags that can't tear loose. And you can save time by ordering all other steels, prepared and ready for the job, from Ryerson stocks that also include wire mesh, structurals, plates, sheets, tubing, and every other steel product.

On your next job let us quote you our lump sum or average pound price.

**Hi-Bond from Ryerson for Greatest Bond Meets and Exceeds New ASTM Spec. A305-49**

With Hi-Bond reinforcing bars, designers can take full advantage of the higher compressive strengths of modern concretes and the higher tensile strength of new steels. Write for new bulletin describing Ryerson service on this unique reinforcing bar. Ryerson Steel, Box 8000-A, Chicago 80, Illinois.

RYERSON CERTIFIED STEELS

# RYERSON STEEL

JOSEPH T. RYERSON & SON, INC. PLANTS AT NEW YORK • BOSTON • PHILADELPHIA • CINCINNATI • CLEVELAND DETROIT • PITTSBURGH • BUFFALO • CHICAGO • MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISCO

# THE CONSTRUCTION WEEK

**WHAT'S EXPECTED**—Basic assumption of the nation's defense chiefs is that Korea is just the first of a series of attacks in the half-war. Indo-China, Iran or Yugoslavia might be next. If this proves out, war demands on our economy can't help but increase. That directs Washington thinking along these lines: Strains would be akin to those of wartime—might last a year or two—*perhaps* longer. They might be harder to bear, in some ways, than wartime strains, because a real war's unity might be lacking to salve federal control of the economy. There'd probably be "politics as usual," which would be no help. Civil production will be cut to make room for more defense, this thinking continues. It's to be more guns, less butter, in the lexicon of War II. It's uncertain how deep the cuts will be or how fast shortages will develop. These could rise or fall with varying tensions. Metals would be the first item hit. Steel, copper and aluminum are short today, mills booked far ahead. Throw more military orders onto these mill schedules and something will have to give. You can see the pattern already in synthetic rubber: Government is opening War II standby plants to produce an extra 88,000 tons of synthetic yearly. Tire makers and buyers will love it. But it's bad news for many other lines. Synthetic rubber requires styrene. Styrene comes from benzene, which is short right now. And benzene is needed by a host of products. It's that kind of backlash—in an economy already loaded to the brim—that can bring on controls, even though odds are against them until it's clear that both military and civil demands can't be met.

**MILITARY CONSTRUCTION**—By the time this note appears in print, the Joint Chiefs of Staff will have firmed up a plan of military operation on which the Corps of Engineers and the Bureau of Yards and Docks can proceed. The immediate plan will concentrate on priorities—designating which things shall be built first, and where. No such plan could be made until Korean operations had developed to a point that indicated the probable character and extent of military requirements. With a definite plan determined, the military construction services can jump immediately into the scheduling and building of works.

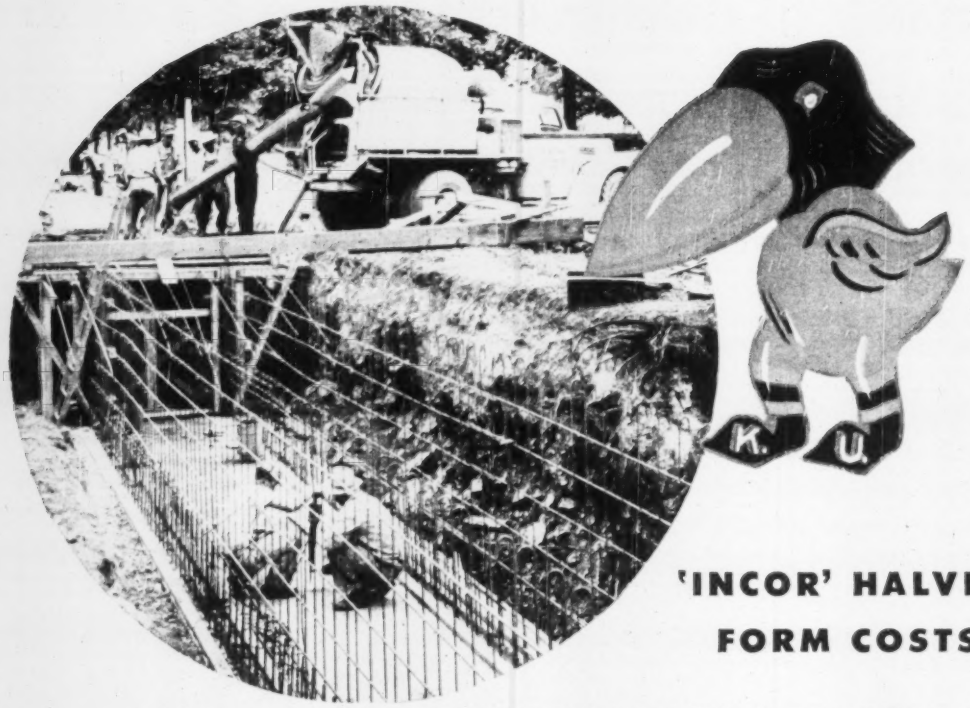
**WHAT'S THE BILL?**—You can find estimates that defense will rise as much as $5 billion in the next 12 months. It costs $3,000 per man—minimum—to induct soldiers. Weapons orders come on top of that. And Congress is in a mood to spend for defense. It sees Korea as proof that our strength slipped too far. And no member wants to go home to campaign without doing something he can point to for defense.

**TIME FOR DECISION**—Idaho's atomic testing station may be the next hot spot in construction labor relations. Two major contractors there have signed contracts recognizing AFL construction trades unions. That action flies in the face of a recent National Labor Relations Board decision in a very similar case at the Hanford atomic project. (ENR June 15, p 23). NLRB says its illegal to sign a contract before there are employed a representative number of workers to decide for themselves. But the unions won't work without a contract, and NLRB General Counsel Denham won't hold elections for construction workers. NLRB, in scoring the Hanford procedure, refused to go along with Denham's "no-election" rule. So, if some slighted union—in numerous past cases it has been the International Association of Machinists, an independent—appeals the Idaho contracts, NLRB, from its Hanford decision, would uphold the appeal. That could force Denham to conduct an election. It could also leave the companies liable for back pay for lost wages.

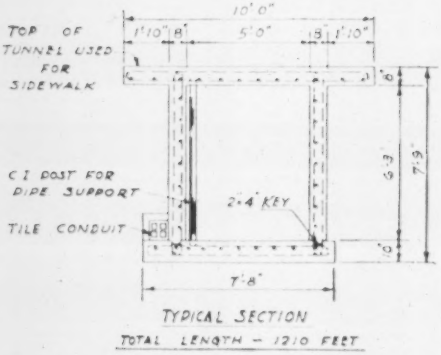
**HELP IS AVAILABLE**—Refusal of the National Labor Relations Board to apply the Taft-Hartley law on many construction projects does not mean that the contractors have no other recourse when faced with secondary boycotts, jurisdictional disputes or any other labor union tactic. There are two sections of the labor law which contractors may turn to on their own, independent of NLRB. One is Section 301. It gives employers (as well as unions) the right to file damage suits for violation of contract. The other is Section 303. It makes secondary boycotts and jurisdictional strikes unlawful and permits an employer to recover damages in federal court for any injury such tactics bring to his business or property. A number of suits have been filed under these sections of the law. One contractor recently won damages from the AFL Hod Carriers for a no-strike violation.

**TAFT-HARTLEY A MINOR ISSUE**—Labor unions still give lip service to Taft-Hartley law as a major point of attack in the forthcoming Congressional elections, but the issue actually has shrunk to minor proportions. Even in Ohio, according to a reliable report, the AFL-CIO political front is not going to use the labor act as one of its big guns against Taft in the senatorial race. Labor already has lost two Senate primary contests to Taft-Hartley supporters in Florida, North Carolina and—to all appearances—has lost one in Oklahoma.

# Sidewalk-Top Heat Tunnel . . .




## 'INCOR' HALVES FORM COSTS




TYPICAL SECTION
TOTAL LENGTH — 1210 FEET

*Problem:* How to transmit heat from central plant to new buildings without pipe trenches disfiguring Jayhawkers campus at University of Kansas.

*Solution:* Heating tunnel under sidewalks . . . concreted with 'Incor'* 24-Hour Cement. Concrete placed one day . . . forms stripped and re-used the next . . . one form-set instead of the two or three needed for equal speed with ordinary cement.

*Result:* On-time completion, bone-dry tunnel, good-looking sidewalk job—everybody pleased!

Typical time-and-money-saving performance of America's FIRST high-early-strength Portland Cement.

*Reg. U. S. Pat. Off.

HEATING TUNNEL, UNIVERSITY OF KANSAS, Lawrence
Architect: CHARLES L. MARSHALL, State Architect Topeka
Contractor: CONSTANT CONSTRUCTION CO., Lawrence
Ready Mix 'Incor' Concrete: THE READY-MIX CO., Lawrence

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LONE STAR CEMENT, WITH ITS SUBSIDIARIES, IS ONE OF THE WORLD'S LARGEST CEMENT PRODUCERS. 15 MODERN MILLS, 27,560,000 BARRELS ANNUAL CAPACITY

# CONSTRUCTION TRENDS

## KOREA'S IMPACT ON BUSINESS

**The U. S. stand in Korea shapes the whole business outlook.**

Direct effects—the calls on business to supply material for the military now—in the next few months will be small. The big question is the effect six months or a year from now.

It will be a month or more before the direct effects can be added up. Best estimates are that military demands on industry will be stepped up about $2 billion in the next few months. They are running at a rate of about $8 billion a year. (See also p 21)

In 1940, U. S. business could have taken that—and more in new orders without trouble. With eight million unemployed and a substantial part of our industrial equipment idle, war orders of that size would have produced no more than a ripple. Even a year ago, business could have geared itself to that much of a step-up in defense without trouble.

Today, the economy is running at close to capacity. There's little slack in the machine. Shortages of steel, railroad cars, cement, lumber are troublesome. There are only about 3,000,000 out of work—not far from what the experts believe is rockbottom.

There's one point on the matter of available manpower that isn't generally brought to mind yet—but the experts figure there's a much bigger pool of workers than is shown by the present BLS labor-pool statistics. BLS—basing its assumption on preliminary census totals—figures there are about 65,000,000 employable in the current U. S. labor force, of whom more than 61,000,000 are now employed. But there's another group—not listed as employables by the census—that can be counted on just as it was in War II. The housewives, the over-age but still able, the partially disabled—even some part of the prison population. In other words, the labor force probably can be expanded to meet most needs.)

**Even so, U. S. business can probably take on another $2 billion of military orders without much strain. But if military spending is stepped up by, say, $5 billion, it may well bring a return of controls on production and prices.**

The controls would be needed to (1) make sure that military orders get priority, and (2) prevent inflation.

In the next few months, though, the direct effects will be small. The big questions in the business outlook center on two other things:

1. Will there be war-scare buying? As yet, there's small evidence that customers are rushing to buy. It is hard to uncover in any case. There have been rumors of tire and auto shortages that led people to buy. In fact, the auto industry believes that the cold war has led many people to buy new cars in the last six months.

War-scare buying, however, can put pressure on markets. If people who planned to buy a new house, a new car, or other products, next year buy them now, prices may be pushed up. Similarly, if retailers start to build their inventories, they'll put pressure on prices.

**(2) Will industry step up its buying? In the next few months, business may increase its buying of raw materials—from rubber to cocoa. Commodity markets spurted on the news of war in Korea, then eased off. But with business already at a high level, and some step-up in U. S. defense spending clearly ahead, many commodity prices will go higher in the next few months. A rush to buy could bring controls over prices.**

War, or even a major boost in mobilization efforts, would clearly bring the need for more steel and electric power capacity, more freight cars, more machine tools.

Business is likely to increase its investment in plant and equipment now running at a rate of $18 billion a year—to meet these demands.

Booming business this year in itself is enough to underwrite a high level of capital expenditures next year. Business has heavy demand for its products. And profits, the major source of funds for new plants and equipment, are high enough to finance a high level of expenditures next year.

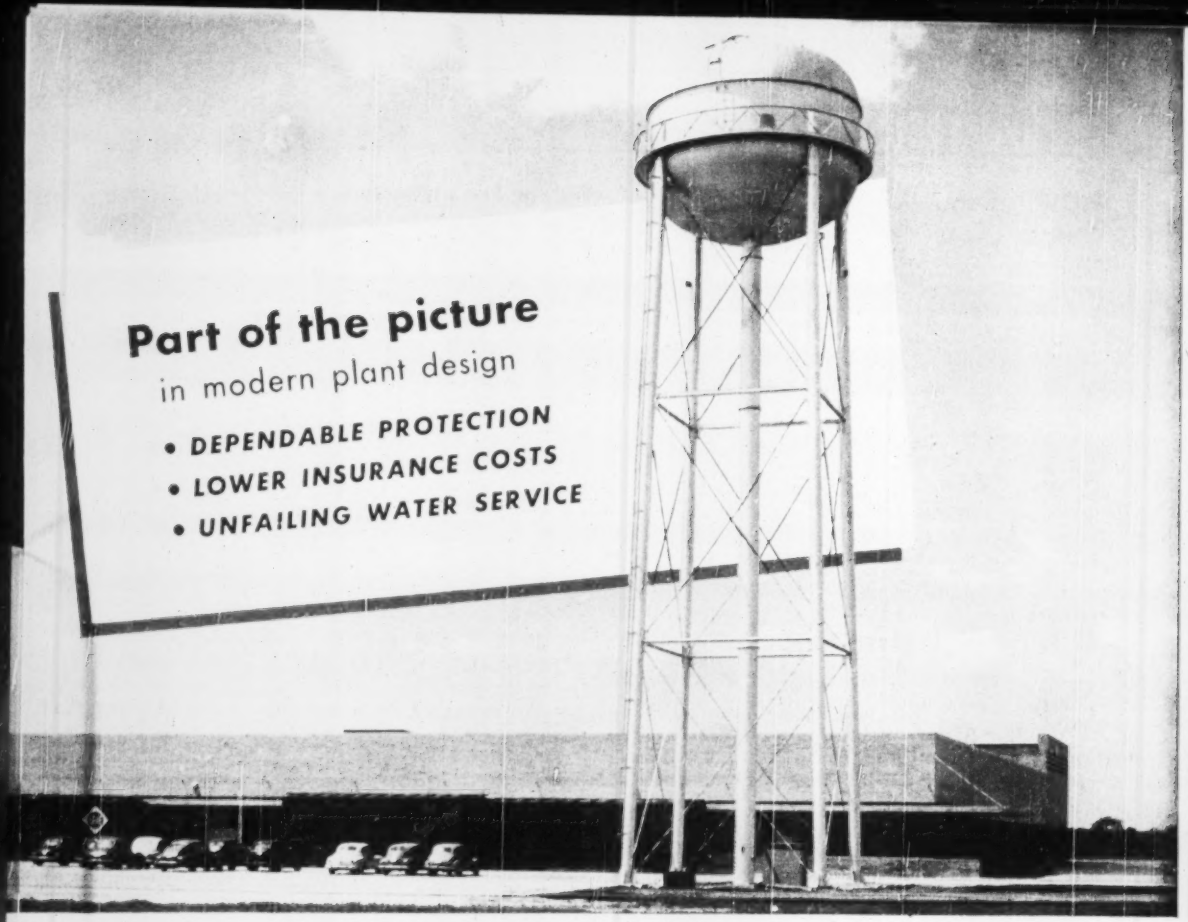
What does all this add up to?

**It means continuing good business. A higher rate of military spending in itself would give business a lift—if it needs one next year. It means the possibilities of a serious letdown in business are wiped out. It probably means pressure on the prices of basic materials—copper, steel, aluminum and others—for which the military will be competing with private business.**

How much business will raise its capital expenditures will be shown later this year by the McGraw-Hill survey of business plans for new plants and equipment. It is clear now, though, that the after-effects of Korea are likely to bring an increase in industrial plant building, one type of construction that has lagged.

As yet there are few signs of panic buying. Business generally is expected to be conservative in building up its inventories. It knows that a rush to stock up could bring on an inventory recession similar to 1948's. But the danger that panic buying may develop will be watched closely in Washington.

**Finally—if demands on U. S. industry's productive capacity are increased too rapidly, there may be a return to some of the wartime controls.**

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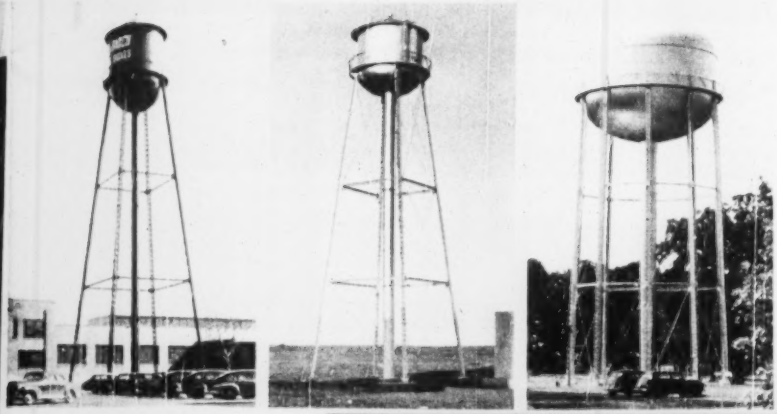

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## Cooperation Needed

STREAM-POLLUTION ABATEMENT is getting to be big business. It hits the headlines. Sportsmen know of it; even housewives hear of it. It gives headaches and opportunities to industrial executives. It challenges consulting engineers and chemists. It stirs the interest of contractors. It keeps regulatory officials awake at night. It's creeping into court records. In short, it is a big field to conquer, with many interests involved.

Speak of pollution abatement—and almost everyone will agree that it is highly desirable. But there is a long stretch between desirability and accomplishment. The crucial questions of the day are: How much and how fast? If you ask the experts, you will get a variety of answers depending on the prime interest of the individual questioned.

Answers to these questions just cannot be picked out of a hat. They must be based on careful study and investigation of each waste problem. They must be attuned to the financial capacity of industry. Big companies can bear the extra load much easier than small ones. The answers must be related to the economic value of the industry to its regions. For example, are jobs more important than pure streams? Also, the answers must look to the future. Processing changes can make an expensive treatment plant totally inadequate. And finally, the answers must be in the public interest.

It all adds up to this: We must have cleaner streams but the solution is not easy or quick. It calls for high caliber teamwork such as has been developed in Connecticut (ENR April 6, 1950, p 112). Government officials and industry's leaders have a big opportunity for effective, result-getting cooperation. In research on wastes and treatment methods; in selecting the most feasible treatment processes; in working out satisfactory procedures for financing disposal plants; and in picking the best sites for new industries. The job can be done cheaper and faster with all skills in harness.

## Roads and Work Relief

IN MASSACHUSETTS the Highways and Motor Vehicles Committee of the legislature has turned down a proposal to use highway work as a means for relieving unemployment. Expenditure of $20 million annually to create 20,000 jobs was proposed.

Experience has shown that money spent in that way is largely wasted in so far as meeting the most urgent road needs is concerned. The money usually cannot be spent where it is most urgently required. Political considerations usually result in its being spread too thin. And men picked from relief rolls generally are inefficient due to inexperience in road work.

In this connection, British experience, as described by Rees Jeffreys in his recent book "The King's Highway," gives support to conclusions reached independently by many highway authorities here. "The Road Fund," he says, "has been used again and again to serve political purposes, and only inadvertently and accidentally to provide for the growing volume of motor traffic."

If we learned anything out of the depression of the Thirties it should be that the best way to create jobs is to put money into normal channels where it adds small increments to normal job-maintaining work all down the line of supply.

## Improving Indoor Environment

PEOPLE TODAY look for much more in the buildings in which they live and work than shelter from inclement weather. They expect and are increasingly willing to pay for an indoor climate as nearly perfect from a health and comfort standpoint as can be produced with available equipment. To provide a satisfactory environment, artificial lighting, heating, ventilating, air conditioning, plumbing and sound control are required.

For optimum economy in design, building designers must consider the equipment to be installed from the instant planning of a structure starts. Both structural and architectural design usually are affected by the type of environment control installations to be made; and conversely, these installations may determine to a considerable extent the structural and architectural design. Methods of integrating installed equipment in building plans, as well as basic principles and data concerning the use of such equipment, have been presented in numerous articles in the ENR Building Designers' Library series.

Latest in this series is a group of three articles on lighting, the first appearing in the issue of July 6, p 42. One of the most important factors affecting health and comfort, lighting also is the one factor people complain most about—and generally with justification. Either for reasons of economy or through ignorance, installations frequently are unsatisfactory.

The article on lighting in the July 6 issue presented fundamental principles of good lighting and illustrated the interrelationship of lighting and structure. Subsequent articles will show how to plan for lighting installations, and will give basic design data—not that building designers are expected to specify lighting fixtures and layout unaided by experts, but so that they can appreciate the problems confronting lighting specialists and understand the reasoning leading to their recommendations.

The end result should be more efficient buildings and more economical designs.

# Alerts the Eyes and Ears ...for greater driving safety

***New double-duty Traffic Marker guides drivers by sound and sight both day and night***

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Made with Atlas White Cement, this corrugated safety strip is constructed flush with the highway surface. By day, its whiteness, contrasting with pavement gray, visibly defines the lanes. By night, its saw-tooth faces catch headlight rays and reflect them back to the driver, forming a continuous ribbon of light.

*In addition*, in daytime or at night, the driver is immediately conscious of a distinct hum or whine should he veer out of lane and ride on the corrugated surface.

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ENGINEERING NEWS-RECORD

JULY 20, 1950 VOL. 145 NO. 3

# Financing tangle stalls Indiana sewerage work

**Court decision or legislative authority required by five cities to break impasse which halts bond sales—Relief by either method is months away**

Larry Stillerman
ENR's Correspondent

An engineering Hammond, Ind., court decision is clogging major sewer improvements in five Hoosier cities.

The decision is somewhat ambiguous, but it packs plenty of power.

It holds the key to $5,000,000 worth of immediate work. Ultimately, it can block some $40,000,000 in long-range sewer projects.

The decision knocked out Hammond's authority to set up its sanitary district as a separate bonding power to raise funds for major sewer projects. (ENR March 16, p. 27).

Indianapolis has a similar bonding arrangement. So does Gary, East Chicago and Richmond. Major work in these cities is halted.

• **No ruling until fall**—It will remain stopped until the state Supreme Court rules on the validity of the lower court's order. And this ruling won't be made until late fall. The Supreme Court is in recess now for the summer.

Meanwhile, three major sewer projects in Indianapolis are stymied. They're worth almost $4,000,000 alone.

And while the projects gather dust, new housing subdivisions are gathering speed. New residences are popping around the Indianapolis perimeter. They're going up without sewerage links to the city.

Developers are installing septic tanks and health officials here view concentrated projects with great concern. In many cases, the soil is not suitable to absorb all the waste that will flow from the new housing.

But there's no alternative under the stagnant bonding set-up, except to stop construction of older sewers installed by developers, forcing higher home prices.

• **Things are stopped all over**—The situation is the same in miniature in the other major cities. Work on $300,000 in improvements at Hammond is stopped. This project precipitated the crisis. Here the Hammond court ruled that the sanitary district is not a separate governmental entity and does not have constitutional authority to issue bonds at 2% of the city's assessed valuation.

The decision was based on an earlier Supreme Court order which outlawed the Indianapolis health and hospital district as a bonding unit. (ENR Dec 15, 1949, p. 27). The court said the hospital district wasn't a separate municipality. The setup was called a "subterfuge to circumvent" the municipal bonding limit. Plaintiff attorneys contend the same is true in the sanitary district.

Bonding enables cities to make capital improvements. Indianapolis can sell more than $12,000,000 in bonds for the city civil district, the main municipal unit. That's 2% of the city's $616 million property value. The sanitary and park districts can also float bond issues to a $12,700,000 and $4,700,000 maximum each.

Currently, Indianapolis has $5,700,000 in civil city bonds outstanding. In the sanitary bonding set-up, there's $3,000,000 floated and in the park district $1,000,000 outstanding.

• **Adverse decision feared**—City officials, anticipating an adverse ruling on the Hammond appeals, add all the bonded indebtedness in one bundle. And that's more than $9,700,000, leaving a $2,700,000 margin on the civil city bonded maximum, close to the legal limit.

Even if it wanted to, mike major sewer improvements, Indianapolis couldn't. Under statutes creating the sanitary district, major sewer and sewage disposal problems are under the jurisdiction of the Board of Sanitary Commissioners. That's "the special taxing district now under court scrutiny."

The court could relieve distressed city officials by letting "bygones be bygones," warning in effect:

"From now on, no bonding power except in the civil city."

Or it could rule that the city assume the obligations of the outstanding bonds, as the current bonded set-up in the city controller's office anticipates.

• **Legislation needed**—In either case, work in the five major cities is blocked. Any real relief would have to come from the state legislature, which meets next January.

Three ways in which the legislature could help to relieve the sewer problems would be:

1. Approve a revenue bonding power. This way, the city could sell bonds, retire them by producing revenue from a sewer service charge.

Citizens would retire the bonds by paying a tariff on the amount of water they use, or on the number of outlets in the house, or on the size of rooms.

2. Approve a direct tax levy. Here the city would be empowered to levy an additional fund raising tax and ac-

(Continued on page 28)

JEEPS GO ANYWHERE—Here, two U. S. soldiers are taking a jeep across a bridge blasted in the Korea fighting somewhere near Chonan. (Wide World Photo)

(Continued from page 27)

cumulate money to retire bonds.

Most school boards build their buildings with special tax assessments. In Indianapolis, a 20-cent tax per $100 raised $1,250,000 for the school board in one year.

3. Approve a new bonding district set-up to circumvent the state constitution "legally."

Here the legislature could create a new municipal corporation with different authorities requesting and floating bonds.

• **Court points way**—The Supreme Court implied this circumvention in its ruling against the Indianapolis Health and Hospital District. It said the hospital authority wasn't a separate municipality because the mayor and city council were still the ruling bodies in bonding issues.

In Indianapolis, the Chamber of Commerce and the Indiana Building Congress are studying new legislation to eliminate the distressing features of the current bonding district set-ups.

They're also hammering at the free-riding federal and state structures using existing sewers and not contributing to the property tax revenue.

Normal tax on these properties, worth at least $100 million in Indianapolis alone, would help pay for some part of the public service load. But with major sewers needed, even this tax increase wouldn't be much, the civic groups concede.

Other Hoosier cities finance their major sewer projects through revenue bonds. There are 63 cities which have financed treatment plants and sewage lines valued in excess of $24,000,000 this way. That's since 1952, when this financing feature was approved.

Three cities—Elkhart, Mishawaka and Evansville—are floating $10,000,000 in revenue bonds for improvements. The federal government is helping this along, too.

But, in Indianapolis, there are approximately 10 major projects worth $300,000 being built. Seven others are planned and the three major projects are blocked.

They'll stay that way, too, unless the court or the legislature comes to the rescue.

## Federal auditors check advance planning loans

Indianapolis' struggle over sewer situation has brought a team of U. S. auditors to City Hall. They want to find out what's become of $234,827 in federal funds.

That's the money Washington has loaned the city to plan sewer line improvements to the Avon disposal plant, additions to General Hospital and construction of two bridges.

The law under which the funds were advanced mandates use of the money within three years after the grants are received. Some federal funds have been on hand since 1945. U. S. auditors are examining city records of these loans. The answer they seek is in files of the state Supreme Court. The recessed court has yet to make final disposition of an appeal from the Hammond court ruling which has put the brakes on the way of sewer construction in five Indiana cities.

The ruling bans the right of city departments to issue bonds to finance their building programs. The lower court decision is based on an earlier Supreme Court ruling which ousted issuances of bonds by semi-independent agencies of a city. This, the high court said, was a "subterfuge to circumvent" statutes creating ways for cities to finance capital improvements.

So loans for advanced planning are on hand, but unused. And neither the city's health nor sanitary departments can start work until a decision is returned.

## Indianapolis suburb blocks treatment plant

Remonstrating neighbors have blocked plans for a $500,000 sewage disposal plant for Speedway City, Indianapolis' 500-mile race suburb.

Members of two civic associations won a temporary injunction against the proposed plant.

Club members live near the proposed plant site. They say it would lower property values and create a health hazard. At present, sewage is dumped directly into Eagle Creek.

The court recommended the city seek another location or consider linking with the sanitary district of Indianapolis. Speedway citizens have thumbed down the latter proposition before, contending Indianapolis' sanitary system is antiquated and service would cost more than in their own plant.

Speedway City Attorney Stanley Easton was considering an appeal to the Indiana Supreme Court. He said delays were hiking the cost of the proposed plant.

The original estimate was $450,000, but lowest bid we have is $530,000. Contractors are upping the price in fear of delays through injunctions such as this," Easton said.

The cost would be paid from revenue bond proceeds, initial hookup charges in bills of the city's water company.

Meanwhile, even though the treatment plant is at a standstill, contracts for trunk sewer lines have been let. Snyder Co., Inc., got a $170,000 bid.

## AISC names 10 winners of C. E. scholarships

The American Institute of Steel Construction announced award of ten scholarships in civil engineering last week. Awards of the new contest are for $1,000 each.

"This is the first year of the competition," said Paul Coddington, chairman of the Institute's Committee for Education. "We plan similar competitions for succeeding years."

Coddington said the program is AISC's part in fulfilling its obligation to American youth. He added that the program has already stimulated several individual companies and regional groups of companies to make scholarship awards of their own.

Winners were selected from a field of 55 high school seniors in 22 states. Each was nominated by a structural steel fabricator.

The jury of educators which made final choices included Wesley J. Hennessy, assistant dean, Columbia University; Nichol H. Memore, director of admissions, Stevens Institute of Technology; and Robert W. Van Houten, president, Newark College of Engineering. Technical consultant was Arthur L. Benson, Educational Testing Service, Princeton, N. J.

The winners and their sponsoring companies are:

Roger Brown, Milwaukee, Milwaukee Bridge Co.; K. B. Huston, Allentown, Pa., Lehigh Structural Steel Co., Allentown; Neil E. Johnson, Wautosa, Wis., Wisconsin Bridge and Iron Co., Milwaukee; Robert V. Kubler, Tulsa, Patterson Steel Co., Tulsa; Everett E. McEwen, Lakewood, R. I., Tower Iron Works, Providence; John L. Nelson, Jr., Concord, Calif., Herrick Iron Works, Oakland, Calif.; Steve J. Poulos, Burlington, Vt., Vermont Structural Steel Corp., Burlington; Robert B. Tucker, Valley Falls, R. I., John E. Cox Co., Inc., Fall River, Mass.; Wilbert C. Weichbrodt, Jr., Forest Park, Ill., Mississippi Valley Structural Steel Co., Chicago; and William R. Wiseman, Greensboro, N. C., Cheatham Steel and Iron Co., Greensboro.

## Loran stations abandoned

U. S. and Canada have abandoned the peace time operation of the "Loran" long-range radio navigation stations in the Canadian Arctic. Construction of the stations, to help build "operation" started after the close of the second World War.

Poor radio conditions in the Arctic lessened the value of the system. Operation of the system involved "tremendous expense," U. S. and Canada shared construction costs.

# Engineers of U.S. and Canada meet in first joint technical sessions

**American Society of Civil Engineers and Engineering Institute of Canada pool talents to discuss mutual interests**

Waldo G. Bowman
Editor

In Toronto last week, several hundred U.S. civil engineers met with Canadians of all the different engineering persuasions in a conclave of international cooperation.

Convened with no more fuss than a purely one-country affair, the occasion was the first joint meeting of the American Society of Civil Engineers and the Engineering Institute of Canada. It was not the first—but the fourth—time that the ASCE had met across the northern border. In 1881 a precedent was set that made this 1950 meeting less than unique.

Nor was it notably different from other meetings in that Canadian shops and scenery provided counter attractions. With such visits in mind, Jack Scott, a reporter for the Vancouver Sun, had recently written: "We've spent hundreds of thousands of dollars every year beguiling Americans into coming up here with their lovely old money, and we gave them roads a Kentucky mountaineer wouldn't let his mule walk over." But Scott's warning to his countrymen went largely unheeded—by the visitors. After the convention, armed with what money they had left, more beguiled Americans pushed further into the interior.

Out of the ASCE Board of Direction meeting, held prior to the convention, came no directing pronouncements, but rather the implication of advancing accomplishments. The Board received with praise and satisfaction the latest policy report of Engineers Joint Council's special committee (ENR July 6, p. 25). The 50-man committee was not being disbanded, but held in readiness for any further service it could render the Federal Water Resources Policy Commission.

The Board also received from a committee under Arthur W. Harrington of Albany, the new set of by-laws required by the recently adopted constitution. They will be submitted to local sections for study and comment.

The convention program met expectations. If you were arranging a discussion of problems and projects of mutual interest to engineers of Canada and the United States, you would include water construction, hydro power and the Great Lakes waterway. You might avoid the St. Lawrence seaway and the Niagara water treaty as cause of possible embarrassment to the Americans whose Congress has been singularly slow in making any commitments. That is just what the meeting planners did.

In arranging such a program, however, you might not think to include subway construction, aluminum bridges and oil pipelines. But the planners included them, too. The first subway in Canada is being built in Toronto. The first aluminum highway bridge was completed recently at Arvida, Quebec. And a 1,150-mile oil pipeline of large diameter is being pushed from Edmonton, Alberta, east and to a tanker terminal at the head of Lake Superior.

Such a program had its important highlights. Here are some of them:

GAIL A. HATHAWAY, special assistant to the Chief of Engineers, has been nominated for presidency of the American Society of Civil Engineers for 1951.

• **First subway.** Digging over the street in front of the hotel and construction noises wafted into the convention room provided a proper atmosphere for W. H. Patterson, chief engineer, Toronto Transportation Com., and Charles B. Molineux, project manager for the contractors, Pitts, Johnson, Drake and Perini, to present papers on Canada's first subway. Canadians were feeling better about it, too, because the second contract had gone to a local firm. On the first contract, of about 1.5 mi., the Canadians had not been able to meet the price offered by the more experienced Americans from New York.

In an area congested by traffic and requiring extensive underpinning, Arthur A. Johnson's "soldier-pile" method offered the most economical way to hold the clay and shale cut and support the street decking. Spanned by 36-in. girder beams and some trusses. The working area was free of columns and bracing (ENR June 29, p. 36). This was a special advantage because the subway is a reinforced concrete box in contrast to the U.S. practice of using steel frames with jack arches. Canada rolls no structural steel, but makes reinforcing bars, and the home products won out—perhaps, says Molineux, with a better design resulting.

As an American working across the border he has, however, had his troubles. For example, the duty is higher on fabricated steel than on plain material. When the contractor attempted to bring in some second-hand steel that had some holes punched in it, he found that this was "fabricated." He also ran into a law that prohibits bringing in automotive equipment that has been manufactured prior to the year for which importation is sought. His truck cranes were excluded. But in both instances the Dominion government was understanding, and exceptions were made to the rules. Overall, the work is going smoothly, and Toronto will have its new 4.5-mi. subway in operation by the end of 1952.

• **First aluminum bridge.** Two aluminum tubroid bridges in the U.S. and England preceded Canada's aluminum highway bridge at Arvida, Que., by a few months, but these were girder and truss bridges while the Arvida structure is an arch. What is more important, the Arvida bridge introduced practices of a new and promising nature. It was learned that aluminum could be saved so that the disadvantage in not being able to fillet-weld it was not important. It was also learned that the difficulties in welding and hot riveting aluminum, which might require scrounge to bolting, were not ones to be concerned with. An extensive investigation of aluminum rivets produced a design with a hole in the rivet head into which a projection from a special gun used with the rivet gun could be inserted. This kept the gun from slipping off while it was rolled to form the head in driving the rivet cold. These annular-headed rivets mark a real advance. They worked well on the Arvida Bridge, C. J. Primeau, Dominion Bridge Co., told the convention. And they will extend the use and economy of structural aluminum, said Ernest Anders and D. G. Elliot of Aluminum Laboratories Ltd., who

reported on the rivet investigation program. An article on the fabrication and erection of the Arvida Bridge appeared in ENR Jan. 12, p 32.

• **Novel coliseum**—Quebec City has just completed a 240-ft span, thin shell concrete roof coliseum in which concrete piles take the horizontal thrust of the arch as well as the vertical loads. Where rock is not available to take the thrusts of such roofs, horizontal ties are usually employed to keep the arches from spreading. Hoyle piles, vertical and battered, were used here. Indeed, was told by Leon A. Frankin, general manager of the Franki Concrete Pile Co. of Canada.

Arrames are used to support the ends of the arches, and these were placed on slabs 25 ft by 4 ft thick. The piles were supported by the piles, some of which had to carry 60 tons compression while others were subjected to 25 tons tension. This was possible because of the special design of the Franki piles, which are cast in place under the blows of a heavy hammer. This driving screws both to increase the bearing value of the foundation material in this case gravel and to anchor the pile to the material so that it can resist uplift. The tops of the piles were embedded in the top slab so that the uplift resistance would be effective against the arches.

The design of the roof limited horizontal deflection to 0.5 in. Despite the fact that the horizontal thrust was of about the same magnitude as the vertical compression, the piles provided a structure that met this rigid specification effectively. The coliseum was used for hockey games 6 months after ground was broken, following a fire that destroyed the old building.

• **Long pipeline**—Nine crews are averaging a mile a day and sometimes reaching two in building a large-diameter pipeline 1,150 miles from Canada's great new oil strike in the Leduc field near Edmonton, Alberta, to Superior, Wis. There tankers will pick it up and transport it to the refineries at Sarnia, Ont. The job is reported to be highly satisfactory and record-breaking progress by E. L. Kalb, president of the Interprovincial Pipeline Co. on loan to the Canadian company from the Interstate Pipeline Co., of Tulsa.

In addition to the pipeline work, 6 pumping stations are under construction as well as storage in six 140,000 bbl tanks at Edmonton and in twelve 150,000 bbl tanks at Superior. The latter storage is necessary to provide tanker supply through the winter months when the pipeline may not operate.

The line includes 450 miles of 20-in. pipe, 340 miles of 18-in. and 360 miles of 18-in. It can deliver from 70,000 to 90,000 bbl per day. All pipe is lined with 3/4 in. cover, and is insulated and protected with bituminous enamel, glass fiber and coal-tar impregnated wrapping. Although the work was delayed somewhat by the Winnipeg floods, the line will be completed this year. Some 470 miles are now in the ground. The total cost will be about $300,000,000. It is provided 33⅓% by the Imperial Oil Co., 25% by other oil companies and 42% by stock sales to the public.

• **Greatest waterway**—No bond between the U. S. and Canada is stronger than that established by the mutual interest and pride of the two countries in the 2,000-mile Great Lakes waterway from the middle of the continent to the head of the St. Lawrence. Both a tribute and a challenge to the U. S.-built Soo Canal and the Canadian-built Welland Canal. No more appropriate subject for joint consideration of the assembled engineers' Directors could have been chosen than the Great Lakes Waterway. Five papers by representatives of the U. S. Corps of Engineers supplied answers to a number of pertinent questions. And while the St. Lawrence seaway was not listed on the program, it also crept into the discussion on frequent occasions. Here then, are some questions and answers:

To the Great Lakes Waterway commodity vessel? Col. John R. Hardin, division engineer at Chicago, cited the 21-ft million ton moved on the waterway in 1948, a year in which maintenance charges totaled only $5,500,000, or 2.5 cents per ton. He also recalled that the total U. S. investment in Great Lakes facilities, including construction, maintenance and dredging, has been put at $550 million per year. That recent figures include for the above have been harbor entrance work, channel straightening and deepening of the St. Marys and Detroit rivers, construction of the Soo locks and harbor improvements, and dredging.

Great Lakes navigation experts concluded from Colonel Hardin's statement that the channels even after the deepening to 27 ft now underway in the St. Lawrence Seaway and made in the St. Lawrence power construction, the possibility of the work becoming imminent as the need for more Labrador and Quebec ore in the mid-west develops.

Here's how the channels developed: [illegible] operation and progress [illegible] Thomas C. Pedley of the Corps' Detroit office, called attention to the soundness of progressive deepening and straightening channels as [illegible] Soo locks in strict accordance with the actual needs of shipping. Thus, the 21-ft channels of 1920 were not deepened until larger ore carriers were definitely assured and some even in existence. Down-bound channels are now 25 ft, with up-bound still 21 ft. Rock channels have been deepened to 26 ft, but in many places they are considerably less in width than the safe 600 ft for two-way traffic. The one instance where needs have been anticipated has been in the 30-ft depth provided over the sills in the new MacArthur Locks at the Soo—and this is what the St. Lawrence Seaway will raise necessarily, as the Canadians foresaw when they built the Welland Canal locks to that same depth.

• **Levels vary**—Are changing lake levels cause for concern? Yes, in so far as man-made constructions should not be allowed to accentuate any change in level, no, in so far as any short time fluctuation of the role of the lakes as a great compensating reservoir for the St. Lawrence and Niagara rivers is concerned. Sherman Moore and Frank De Kirchner, of the Great Lakes Survey, detailed some of the facts in separate papers. Crustal movements of the earth are causing the shores of Lakes Ontario and Erie to subside at the rate of 1 ft in 100 years, said Moore. There is a line of zero movement that closely follows the northern shores of the lakes. North of this line, the land is rising, south of it there is subsidence at a fairly constant rate. If the proposed Mackinac Straits bridge were to be built, its two ends would move apart vertically at the rate of about 0.5 in. per year. The water depth over the Soo locks still is decreasing, while in Duluth harbor it is increasing with consequent flooding of some water front facilities. There are consequences to be noted and provided for. "And if you want to take a really long range view, says Moore, you can count on a complete change in Great Lakes drainage, with consequent ruin to all of the harbors, in just about 50,000 years.

The lake levels fluctuate about 3 ft in any one year. Kirchner reported, but you can't predict levels more than a month in advance. Inflow and outflow aren't calculable any closer than that. Fluctuating levels cause the most trouble in Lake Erie because it is the shallowest—but the stormiest. Winds have caused the water to be 12 ft higher at Buffalo than at Toledo. The Chicago River diversion has lowered lake levels about 2 in.—much less than usually supposed. The remarkable short effect of inflows into the lakes was described by Kirchner by supposing a 50,000 cfs increase in discharge of Superior into Huron-Michigan. Six months later it would cause a 0.17 ft rise in the lower lakes, and its effect would still be noticeable 30 months later.

• **Shore line protection**—Do we know how to protect the shorelines? "We are learning," said Col. Frank H. Forney, district engineer at Buffalo. "A century of experience has shown the futility of half-way measures and of inadequate structures. It has shown that permeable groins are no good in the Great Lakes; that erosion and accretion are seldom in balance; that long sloping beaches are the best protection; and that bulkheads should be built to high water height plus twice the wave height—or once the wave height if paved back slopes can be used."

Out of all five discussions, a case was made for the great economic value of the Great Lakes waterway and its harbors, for the soundness of the procedures by which it is being developed and maintained—and most of all for continuing measures for its future growth and protection.

• **Winter construction**—It costs 5% more to build dams and steam power plants in winter than in the warmer months. The authority for this statement is the Hydro Electric Power Commission of Ontario, which has done more winter work than any other agency on the North American continent. It has to, in five construction months out of every year. Gordon Mitchell and R. B. Young, of the commission's construction and research departments, gave the rules for effective construction. Some are:

Use steam heat and provide 100 hp of boiler capacity for each yard of concrete mixer capacity.

Use 100-lb pressure steam so lines can be left exposed where necessary. But insulate lines where possible with asbestos when overhead and with sawdust when they can be put in boxes in the ground.

House and heat conveyors with the steam lines.

Heat sand and water, not the coarse aggregate. Use steam jets on the surface of sand piles only so as not to waste heat.

Store water in coil-heated, wood-stave tanks at 100 to 140 deg F.

Place concrete at 50 deg. This can be done even if it is hauled in trucks if the sand and water are sufficiently heated.

Use plywood forms without protection, but enclose dressed lumber in tarps.

Cure with dry heat to avoid formation of ice.

Install an extensive and effective fire protection system.

It is possible also to use winter weather to aid construction. A. J. S. Taunton, deputy chief engineer of Winnipeg, told how he built coffer-dams of ice to repair the city's bridge piers. It is necessary to freeze the ice all the way to the bottom artificially. This is done with dry ice. A trench is dug around the pier, about 5 ft wide and not quite as deep as the thickness of the surface ice. Cubes of dry ice are placed in the trench which is covered with tarpaulins. As the ice vaporizes, it freezes the river to a considerable thickness beyond the sides and bottom of the trench. Successive trenches are dug in this way at about 30-in. intervals until the bottom of the river is reached. An ice cofferdam, 6.5 ft deep was built with 4,000 lb of dry ice which cost 4c per lb.

• **Hydro power**—Winter problems beset dams at other times than during their construction. R. F. Legget, director of Canada's Division of Building Research, reported on the subject of ice pressures as loads to be considered in design. Practice throughout the world varies widely, largely because there is little scientific guidance available. Norway, which once used 30,000 lb per lineal ft of dam, has progressively lowered the value to 3,350 lb. The U. S. Bureau of Reclamation has variously used 5,000 to 20,000 lb. Sweden uses 20,100 lb and Canada 10,000 lb. The trouble is that field measurements are difficult and lab studies cannot simulate field conditions.

The Ontario Hydro Commission's current dam building is largely concentrated on the Ottawa River. J. R. Montague, director of engineering, described it. It may only be noted that three large jobs are underway on the Ottawa—Le Cave (144,000 kw), Chenaux (120,000 kw), and Des Joachims (358,000 kw). The unusual construction of the first large project was described in ENR Feb. 9, p. 32.

One of the notable characteristics of Ontario dam building is the practice of placing concrete in high lifts—50 ft is usually mentioned, but discussion brought out that as much as 85 ft has been placed at one time. A paper at the same session by R. R. Fuller, of the Buffalo District, Corps of Engineers, described Mt. Morris Dam (see this issue, p. 6) being built near Rochester, N. Y. where the American practice of using 5-ft lifts is being followed.

The subjects mentioned above do not by any means exhaust the list of those covered by the program. Two panel sessions on engineering education and management enjoyed the largest attendance. There were many papers in other sessions that were useful and informative but not directly focused on the geographical loci of the meeting. And there was a completely separate and significant meeting held at the University of Toronto devoted to hydraulic model testing. In total, the outpouring of technical information reflected the diverse interests that were naturally represented.

## Government re-studies plans for buildings

**Protective design and dispersal gets new attention as result of war threat—VA recalls hospital bid invitation**

Eruption of the cold war into open conflict in Korea has put added emphasis on protective design and dispersal of federal buildings. A number of structures planned for future construction are under re-study by the responsible agencies, in consultation with the National Security Resources Board.

Information on these re-studies necessarily is closely guarded, but one example came to public notice recently. The Veterans Administration withdrew its invitation for bids on the proposed 500-bed hospital in Cleveland within a few hours after announcing it. In explanation, VA said later that the withdrawal had been made to permit re-study of the plans to make sure that the hospital meets the protective standards and other criteria established by the civilian mobilization office of NSRB.

• **Atomic protection standards**—Government agencies generally have been applying, since February, the standards recommended then in the NSRB Report on Damage from Atomic Explosion and Design of Protective Structures. In determining locations of government structures, federal agencies for the last 20 months have given consideration to the dispersion standards issued by NSRB in October, 1948.

A more comprehensive report on the effects of atomic bombs and on standards and specifications for protective aspects of design will be ready for the printer next month. This document will amplify greatly the information on recommended practice for government and private designers.

The Cleveland hospital was the only project on VA's schedule that was immediately affected. No postponement was expected in the award of two other projects now up for bids. One of these is a 500-bed hospital at Oklahoma City, for which bid opening is scheduled July 25. Opening date for bids on the 750-bed hospital at Pittsburgh is Aug. 15.

Two other hospitals still in the design stage, one for San Francisco, the other for Washington, D. C. are to be re-studied. Both were to have been VA's standard 500-bed design.

Postponement of the Cleveland structure will delay the start of a second VA hospital there. A temporary hospital now occupies the site of the second hospital. Operations there will have to be transferred to the new location before the site can be cleared.

## BIDS AND BIDDERS

(Many unopened bids received Latter Construction Reports page 72, went to press)

**Cachuma Dam** Matty Constructors, Inc., Los Angeles, Calif., will construct $6,717,600 Cachuma Dam, in Santa Ynez River, Santa Barbara County, California, for Bureau of Reclamation, Contra, Calif.

**Pipe Line** H. K. Ferguson Co., Houston, Tex., has been selected as consulting engineer for natural gas pipeline to extend from Texas through Louisiana, Mississippi, Illinois, Indiana and into Michigan for the Valley Gas Pipe Lines Co., Inc., Houston. Total estimated cost is $147,000,000.

**Hospital** Veterans Administration, Washington, D. C., will open bids August 15, for construction of $3,000,000 general medical hospital in Pittsburgh, Pa. Mitchell & Boom, Ingham & Boyd, Mitchell & Ritchey and York & Sawyer, all of Pittsburgh, are architects.

**Military Installations** U. S. Engineers at Albuquerque, N. Mex., awarded contract to Highland Engineering Co., Santa Fe, N. Mex., for three frame buildings at Fort Bliss, Tex., $2,000; sentence relay installation at Falcon, $3,000; and at Cape Newenham, $24,000. Contract was awarded to Grayland Construction Co., Bellingham, Wash., at $8,855, 000, for military installations at Raymond, Wash., and Fleming, while E. H. Pierce & Co., Inc., received contract for seven barracks buildings at Fort Richardson for cost $2,574,000.

**Sewage Plant**—Hoevel & Lincoln Co., Cleveland, O., has plans under way for construction sewage plant at Cincinnati, O. Estimate is $4,000,000.

**Dam** Bureau of Reclamation, Great Falls, Mont., will open bids August 15, for Libby Dam and dike on Middle River, Montana. The project, which is part of the Upper Missouri River Basin Project, will include 16 miles of road excavation, 11 miles of road embankment and other work.

**Bridges** Brown & Stout Aves., Philadelphia, Pa., low bidder at $48,995, for bridges over Cooper River and Union Canal, when the New Jersey Turnpike Authority opens bids July 14.

**Sewage Treatment Plant** L. H. McGee & Co., New York, N. Y., has been awarded contract for sewage treatment plant in Pasadena, R. I., at $2,847, 000. Metcalfe & Eddy, Boston, Mass., are consulting engineers.

**Shopping Center** MacDonald Products Co., San Francisco, Calif., will construct shopping center at Walnut Creek, Calif., by own forces. Estimated cost is $5,000,000. Robert Lipsey is architect and Byron Nishkian is engineer.

**Gas Pipe Line** G. G. Griffis, Inc., Tulsa, Okla., has been awarded contract for natural gas pipe line from near Camden, N. J., to Glendora, Berlington, Vineland and Penhauken, to the South Jersey Gas Co., Atlantic City, N. J. Estimated cost $3,500,000. Contract price about $2,175,000.

**Power Plant Addition** City of Cleveland, O., will open bids August 15, for power plant addition in Cleveland, O., to cost about $2,000,000. E. J. Schweniker, Cleveland, is engineer.

**Vocational Institutions** — Johnson, Drake & Piper, Inc., Oakland, Calif., low bidder at $5,440,000 when the California State Division of Architecture, Sacramento, opened bids July 11 for constructing group of buildings at Camarillo, Ventura, Institution Farm, Corona, Corona Road, Santa Ana, Calif., area.

**Hospital** Columbia Memorial Hospital, Hudson, N. Y., awarded contract for hospital to William L. Crow Construction Co., New York. Cost will be about $2,000,000. Eggers & Higgins, New York, N. Y., are architects.

**Housing** Perth Amboy Public Housing Authority, Perth Amboy, will take bids August 15, for the construction of public housing in Perth Amboy. Estimated cost is $2,500,000.

**Storm Sewer** Commissioners of Lucas County, Toledo, O., plan to ask for bids in October for 2 miles 7 and 144 inch Storm Relief Sewer, from Cheltenham Rd. to Ten Mile Creek. Cost is estimated at $2,000,000. Gordon Knepper, county engineer.

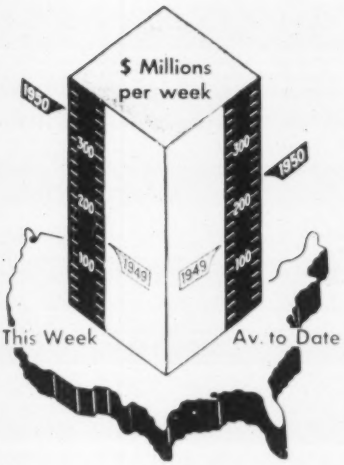
**High School** Gerosa & Castagna, Inc., Brooklyn, N. Y., has been awarded contract for high school for the Board of Education, Empire City School District 7, Great Neck, N. Y. Starrett & Van Vleck, New York, N. Y., are architects.

**Housing** S. S. Sagalyn, Inc., New York, N. Y., has been awarded $2,555, 000 contract for the construction of second unit of 144 apartments in Brooklyn for the New York City Housing Authority, New York, N. Y.

## COSTS AND VOLUME

ENR INDEX NUMBERS

| Index Base = 100 | 1913 | 1926 |
|---|---|---|
| Construction Cost, June 30 | 711.91 | 219.05 |
| Building Cost, June 30 | 676.90 | 209.74 |
| Volume, June 30 | 427 | 182 |




### Activity This Week

As reported to ENR in millions of dollars

Amount of contracts let

| | This Week | Week of July 20, 1950 | Week of July 21, 1949 | Cumulative 29 wks. 1950 | Cumulative 29 wks. 1949 | % chge |
|---|---|---|---|---|---|---|
| Federal | | | | | | |
| State & Muni. | | | | | | |
| Total Public | | | | | | |
| Total Private | | | | | | |
| U. S. Total | | | | | | |

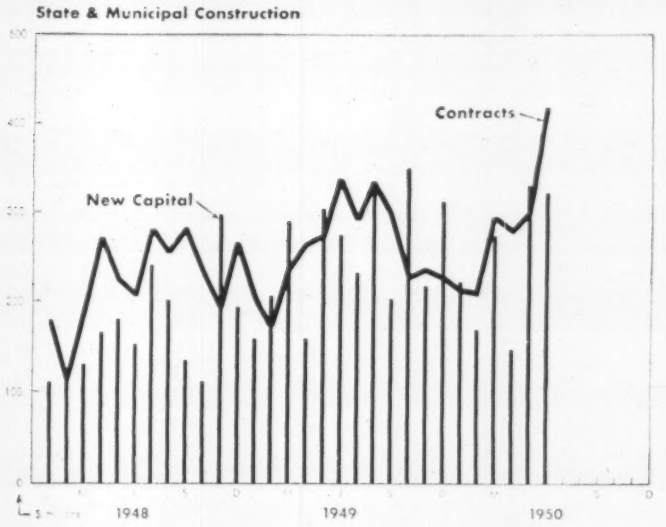
Contracts by type of work

| | This Week | 29 wks. 1950 | 29 wks. 1949 | % chge |
|---|---|---|---|---|
| Sewerage | | | | |
| Bridges | | | | |
| Industrial | | | | |
| Commercial | | | | |
| Earthwork | | | | |
| Waterworks | | | | |
| Residential | | | | |
| Public Works | | | | |
| Total | | | | |

New capital for construction

| | This Week | 29 wks. 1950 | 29 wks. 1949 | % chge |
|---|---|---|---|---|
| Private | | | | |
| Public | | | | |
| Total Capital | | | | |

# CONSTRUCTION BUSINESS




## State and local financing supports record construction volume

State and municipalities are financing the greatest value of construction in their history. And present new capital volume should keep contracts going close to the present day high rate for some time to come.

New capital raised for construction by bond and note issues the first half of this year came to a record $1,465,776,000—5% over last year. As may be expected, this financing has supported state and local contract awards of $1,714,875,000 in the first half—16% more than last year.

Here is why:

• **Trend**—Over the long term, state and local heavy engineering construction contracts have been financed about 80% by bond and note issues plus federal aid. The rest of the money comes from tax revenues. But last year, new state and local capital of $3,040,711,000 plus $885,000,000 federal aid to highways came to a little more financing than the $3,110,420,000 in contract awards let.

So current financing volume is more than enough to support the present volume of construction. Probably heavy construction contracts will soon begin to outstrip new capital—until state and local capital plus federal aid represent something like 80% of total contract volume (the other 20% being financed out of current tax revenues—gasoline, sales, real estate).

• **First half 1950**—But so far this year, state and local capital is still about as high as contract volume. This leaves plenty of room for further increase in contracts based on current financing volume.

• **July**. New capital the first two weeks of July is $105,983,000. This is an average of $53 million a week—just $3 million under the average in the first half. Meanwhile, state and local contracts of $146,271,000, or $73 million a week, are 11% higher than the first half. So the trend so far in July is toward slightly less new financing than in the first half, but increased volume of construction.

• **Not too high**. Present volume of contracts does not seem too high, to list, when these facts are considered:

1. State and local authorities must provide facilities to serve a population 25% greater than in 1929.

2. Yet last year's physical volume of state and local construction was just equal to 1929 and 1927 volume; it was 9% under 1928, in terms of physical volume (allowing for today's depreciated construction dollar by applying ENR Construction Cost Index).

3. The ENR Backlog of proposed state and municipal construction is still gaining. The backlog actually increased $896,875,000 or 4% the first half of this year, even as contract awards reached new highs. It now totals $23,295,518,000. This is enough proposed work to support almost seven years' future volume at the same rate as this year's contracts during the first half.

## Bids continue low at highway lettings

New York State highway lettings June 21 show no change in trend of bid competition or unit prices from earlier lettings June 1 and May 10.

Thus there has been no change, at least in New York, in the sharply competitive, low-price bidding that was found to be nationwide in ENGINEERING NEWS-RECORD's survey last month (ENR June 22, page 23).

Three large jobs bid on June 21 showed bidders were fewer and low bids not so far under engineers' estimates as on smaller jobs. Figures on these three projects are: (1) four bidders, low bid $4,979,447, 4% under engineers' estimate; (2) five bidders, low bid $3,163,476, 4% under estimate; (3) four bidders, low bid $1,581,184, 9% under estimate.

Lettings May 10-June 21 have drawn an average of 6.8 bidders per job. This is on a total of 37 projects with total low bid value of $210 million. The typical low bid is 12% under the engineer's estimate, with a range of from 4% to 32% under estimates. This pattern has been consistent at these last three lettings.

## Construction backlog is now $49.4 billion

Growth in the ENR Backlog of Proposed Construction increased $289 million in June to a present total of $49,416,101,000.

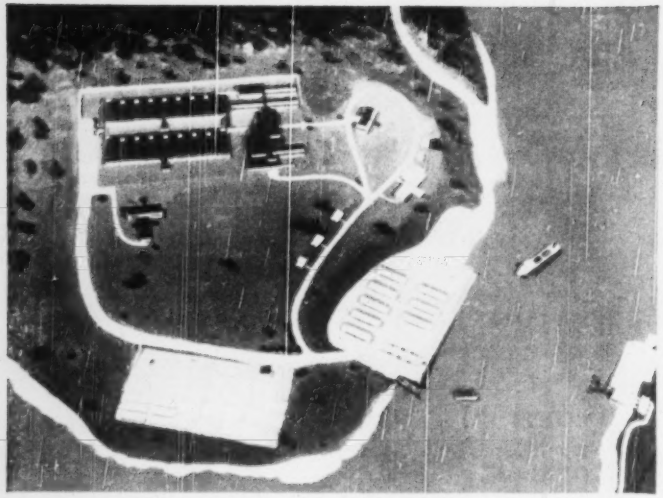
This backlog is big enough to support four year's future construction at this year's contract rate.

The big June rise in backlog is mainly commercial and residential buildings—up $59 million to $4.7 billion; industrial buildings—up $59 million to $4.7 billion; public buildings—up $69 million to $11.5 billion; and private unclassified construction, such as pipelines and transmission lines—up $54 million to $5.0 billion.

## Cost of living up

The cost of living increased 0.8% between April 15 and May 15. This is the largest increase for one month since July, 1948, when the index went up 1.2%.

The index is reported by the Bureau of Labor Statistics as 168.6 for May 15 (1935-39 = 100). It is still 0.4% under a year ago.



# Strict sanitation and isolation needs key design of disease research center

A most unusual project necessitated by stringent health precautions will be built by the government on small Prudence Island, in Narragansett Bay, R. I.

It will be a $25,000,000 research laboratory recently authorized by Congress for research into causes and cures of the disease known scientifically as "Aphosa," or more colloquially as "hoof and mouth disease."

Washington observers were interested to note that although the project was strongly urged by cattle interests throughout the United States, no Congressman put up a fight to have the laboratory located in his state. So contagious is hoof and mouth disease that most cattlemen fear to have the laboratory anywhere near their herds, even though they have been assured by the Department of Agriculture which will operate the laboratory that animals outside the laboratory walls will not be affected.

• **Ruins herds quickly.** The disease can decimate a herd of cattle in very short time. It has never been firmly established in the United States, but its recent occurrence in Mexico (1946) and a continuing battle against it there caused considerable alarm in the United States. It made Congress agreeable to establishment of a laboratory for control or eradication of the disease.

All research is to be conducted in specially constructed buildings within a compound of about 15 acres. This compound will be enclosed by a high wall of reinforced concrete, sunk far enough into the ground to make it rodent proof. The wall will be 5 ft high topped by a 3 ft chain link fence.

There will be three entrances, all closely guarded. Persons entering the compound will first pass through an outer locker room where they leave all street clothing and personal belongings. They will don sterilized laboratory clothing, and, if they are workers in the contaminated area, will change again into work clothes of their own units. Shower baths will be compulsory before leaving an unit within the compound.

• **What a life.** Only healthy cattle, hogs, sheep or other animals will be taken to the island. Once inside the walls, the animals will be kept constantly within isolation buildings, not in pastures or open lots. They will have no contact with other livestock, birds, insects or even the open air.

Main sections within the compound are to be several laboratory wings, a small animal laboratory wing, 16 isolation laboratory buildings for research with large animals, feed storage buildings, laundry, shops and incinerators.

Laboratory wings will be equipped for studies of virus diseases of animals, and will house the pathology, biochemical and physics laboratories.

The isolation laboratories for research with large animals will be two stories high. On the first floor will be the isolated animals and the men who work with them. There is no connection with the second floor except for feeding the animals.

• **Strict sanitation.** Incinerator units will be connected directly to the laboratories and animal isolation quarters for safe destruction of all refuse, waste and extraneous matter within the compound area. All sewage will be sterilized before discharge.

A series of tunnel-like passageways will connect all the buildings and the areas within the compound, forming a double corridor system. Contaminated animals and material and exposed personnel will use one passageway on the ground level. This will be built of reinforced concrete and glass blocks to permit easy disinfection.

The second passageway on the second floor will be disease free and will be used for feed distribution as well as observation and maintenance of mechanical equipment.

Structures outside the compound will not be exposed to the disease. Consequently, the stiff control system will not be in force. Outside the compound, the headquarters building will contain office space, conference rooms, a library and administrative facilities. Also outside the compound will be a power plant, garage, a fire house, feed and fuel storage buildings.

## Ohio compact fight aims to enlist all states

A U. S. Supreme Court test aimed at preserving "interstate" compacts throughout the entire country—and based on a new issue—has been agreed upon by the attorneys general of states participating in the Ohio River Valley Sanitary Compact.

The case arises from the refusal of West Virginia's Auditor to approve that state's annual contribution to the ORVWSC (ENR April 20, p. 27). The matter was first appealed to the West Virginia Supreme Court, which upheld Auditor Smith.

Compact states consider the issue for presentation to the U. S. high court to be this: Can a state withdraw from such a compact once its legislature has ratified it? They also consider this an issue of national significance; thus will attempt to enlist the support of all other states in their legal fight.

Pennsylvania will file a separate brief, based on its interest in maintaining the compact with West Virginia as a participant.

Because of West Virginia's position on the Ohio River, its withdrawal from effective participation in compact programs would render the work of other states ineffective even though the others could legally continue to carry on the compact. Stream cleaning efforts of Pennsylvania upstream would be nullified if West Virginia polluted the Ohio below it. The efforts of downstream states, with West Virginia polluting, would be less than completely effective.

## Cities push expansion of parking facilities

**Boston, Buffalo, Los Angeles, and Harrisburg plan underground garages, street parking, and island lots.**

Parking gets to be a bigger and tougher problem every year.

And every year, many cities move toward solutions—either new lots and garages, or new laws to straighten out the problem.

Here are some plans that have recently got underway. They call for parking:

• **On an island**—In Harrisburg, Pa., the plan calls for a parking lot on Island Park, in the middle of the Susquehanna River. It will hold 615 cars.

Free bus service downtown will be supplied. Harrisburg merchants have agreed to underwrite the bus service experimentally. Busses will leave the parking lot every seven minutes.

Island Park is only a quarter-mile from Market Square, center of the downtown business area.

• **Under the Common**—RFC has approved a $12,000,000 loan for a garage under Boston Common.

The loan will go to Motor Parks, Parks, Inc. Boston gave the company exclusive rights to build the garage. The company will hold a 40-year lease.

Approval came only 24 hours before the agreement between the city and Motor Parks, Inc., was to expire. If the loan had been delayed, the city would have been free to deal with others.

• **In apartment-hotel zones**, in Buffalo, N. Y., the city plans to amend its zoning ordinances to call for 1000 off-street parking facilities in apartment-hotel districts.

Present ordinance requires one car space for each two units in the districts. The change emphasizes the need for additional parking facilities in all parts of the city. Buffalo and Erie County Planning Association have already approved the proposal.

• **Below Pershing Square**—Los Angeles' first attempt to get an underground garage failed to attract a bid. Now the Pershing Square plan has attracted two.

Ben Weingart, president of Consolidated Hotels of Cal., Inc., has offered to build a three-level, 1,800-car structure. The company would pay the city $15,000 a year rental.

Lord J. Lewis, president of City Parks Garages, Inc., has offered to build the same type structure and pay the city either $25,000 a year or 25% of the net income.

Costs would run to about $5,000,000. The builder would pay it and hold a 50-year lease.

STILL BUILDING—California has had one of the largest expansions of power-generating capacity in the country, but it isn't done yet. This photo shows work on the Big Creek No. 4 hydroelectric project of Southern California Electric Co. on the San Joaquin River. The dam will rise 230 ft above the channel, with a crest length of 900 ft. The river flows through an 846-ft diversion tunnel. Bechtel Corp. and Morrison-Knudsen Co. are contractors.

## $250,000, 6 months, Hawaii road bill

The Hawaii Public Works Department says it will take about $225,000 and six months to undo the damage done to its roads by the June 1-22 eruption of Mauna Loa, the world's biggest volcano.

According to Robert M. Belt, superintendent of public works, permanent restoration of the buried roads can not even be undertaken until September or later because the lava will be so hot until then that it will not be safe to work on it with dynamite.

Mauna Loa sent three streams of lava rumbling down its slopes from the 11,000 and 8,000 ft levels in its greatest outpouring in 90 years, estimated at 500,000,000 tons. Each cubic yard of lava weighs about 3,350 lb.

The lava ran down the southwest slopes of Mauna Loa, crossing the round-the-island belt highway at three points for widths of 3,050 ft, 1,350 ft and 1,085 ft, and piling up to 60 ft or more in some places.

• **Roads passable**—Some 270 quakes accompanied the overflow, the largest of which cracked roads as far as 12 miles away. The cracks were less than an inch and readily repaired by maintenance crews but now are under close watch.

Bulldozers pushed temporary roads over the two narrowest flows by mid-June, about two weeks after they had stopped running. But the wide third flow was too hot for even temporary crossing until July.

The roads are passable now but still noticeably hot to the passerby and so hot you can't pick up a rock along the wayside and hold it for very long.

Red-hot lava is still visible down some of the crevices, and steam rises from the openings. Parking on the flows for more than a few minutes is unwise.

• **New routes**—Mr. Belt says there will be no attempt to uncover the old roads. Instead new routes over the flow and slightly closer to the sea, are planned.

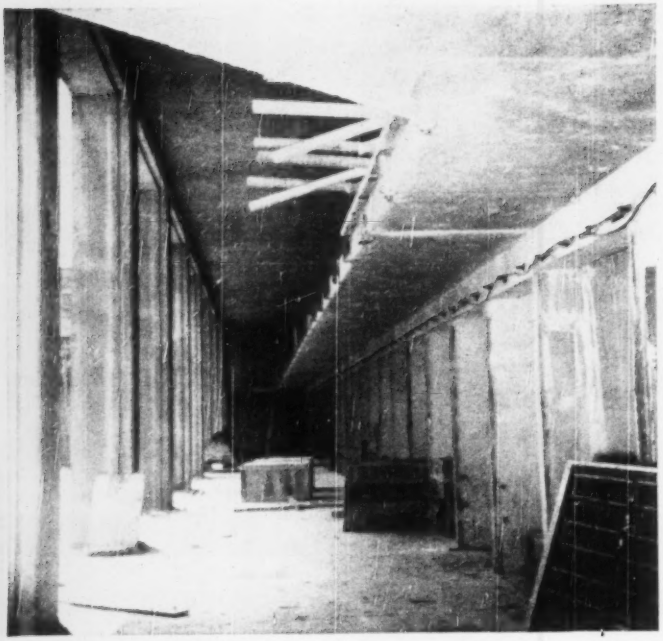
Counting the extra grades needed for approaching the flow, the total amount of new road needed is about 14 miles. Federal aid is sought for the reconstruction as the road is on the federal-aid system.

When the flows are cool enough the frothy top will be blasted away just deep enough to assure a smooth crossing and a macadam road will be laid directly on the lava bed.

Main danger in the construction is that blisters and tubes in the lava may cause cave-ins, but the blasting is expected to spot these before bulldozers or any other equipment go plunging into them.

E. S. Kaiser, district engineer for the area, will be in direct charge of the new road construction.

The flow wiped out the little town of Hookena, a ranch and tourist lodge, killed 16 head of cattle, and left 80 people homeless.



CELL BLOCK GALLERY contains two tiers facing courtyard column openings that will be glassed in. (T. P. S. photos by Frank Dobbs)

Texas saves 50 percent on material costs by using . . .

# Plastic-Faced Forms for Prison Cells

MATERIAL cost is just about total cost on Texas Prison System construction, so prison officials are constantly on the lookout for cheaper materials.

One material they are sold on is plastic-faced plywood for concrete forms wherever there is an opportunity to get a large number of repeat uses.

A perfect opportunity exists in a new cell block now under construction at the main prison, Huntsville. In each height of each 6-unit concrete cell block (9 ft. 2 in. net right to turn panels made up of standard 4x8 plywood sheets. Prison officials are getting 16 uses out of each wall form panel—one side eight times, then reversing the plywood on the frame and using the other side eight times. In contrast, exterior grade plywood listed only four uses.

R. H. Jackson, engineer for the prison, estimates that the plastic-faced plywood saves at least 50 percent on all form materials (including framing lumber) compared to exterior grade plywood or lumber sheathing. He takes into account:

1. The plastic-faced plywood's cost—50 percent more than exterior plywood.

2. Minimal form wear and tear caused by the inefficient and sparsely experienced prison labor. Because of the higher number of uses, plastic face is exposed to more edge damage in stripping and erecting, although the hard facing resists this damage somewhat. Mr. Jackson estimates that "killed" (no weight yet significantly more) second of the sheets.

3. Reduction of panel use average, by special cuts, for less frequently used form designs.

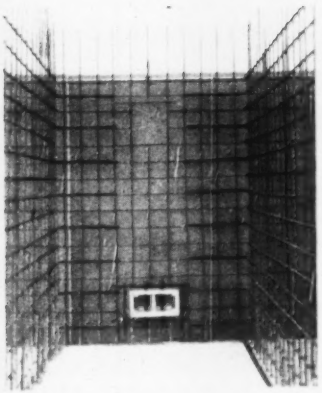
• Project description. However, there are a few suggestions worth noting as to structure and description of the cell block will indicate. Two long buildings, each containing two tiers of cells, face each other across a courtyard. Overall, cell block dimensions (two buildings and courtyard) are 102 x 406 ft. In each building, columns support the third tier and the roof, on the courtyard side. Glass enclosures between columns create natural-lighted upper and lower galleries, into which second- and fourth-tier catwalks cantilever. Groups of facilities including stairways and shower rooms project into gallery areas at intervals, to sectionalize the galleries.

Cells are 9 ft. 2 in. high, 9 ft. long and 5 ft. wide, inside. Each contains a bed, a toilet, a lavatory, a light and a radio outlet. Plumbing and electrical facilities are serviced from stove-height pipe chases that run along the back of the centre building at each tier level.

At the third tier level, in the pipe chase outside wall, are exhaust fans. These fans remove ventilation air that has been fed to the cell blocks through ducts in the courtside wall columns. The air passes into cells through barred doors at the front, then into pipe chases through barred openings in the back. Openings in the second, third and fourth pipe-chase floors allow full air passage to exhaust fans.

• Walls and floors. More bars are unseen than seen, needless to say. In seeking "escape-proof" properties for cell walls and floors, designers balanced concrete costs against steel cost and came up with 6-in. walls with ¾-in. rods at 6 in. both ways; five-inch floors and roof with normal two-way reinforcement for 30-psf live load. (The first floor, under cells, is 12-in. double-reinforced concrete on the ground.)

Regular wall form panels are framed with double 2x4 wales, and 2x4 plates, sills and studs—the studs at 16-in.



HIDDEN BARS—reinforcing steel for concrete cell walls is half-inch round, 6-inch spacing both ways. New plastic-faced plywood form erected at back. Opening shown is for ventilation system.

spacing. Solid-core plywood ⅝ in. thick, with phenolic-resin plastic bonded to both surfaces, sheathes the frames. Resin weight is 60 lb. per 1,000 sq. ft. of plywood. (The manufacturer states that 60 lb. is sufficient for plain-edge use; resin should be heavier for steel-bound forms). Sheets are cut with ordinary hand or power saws.

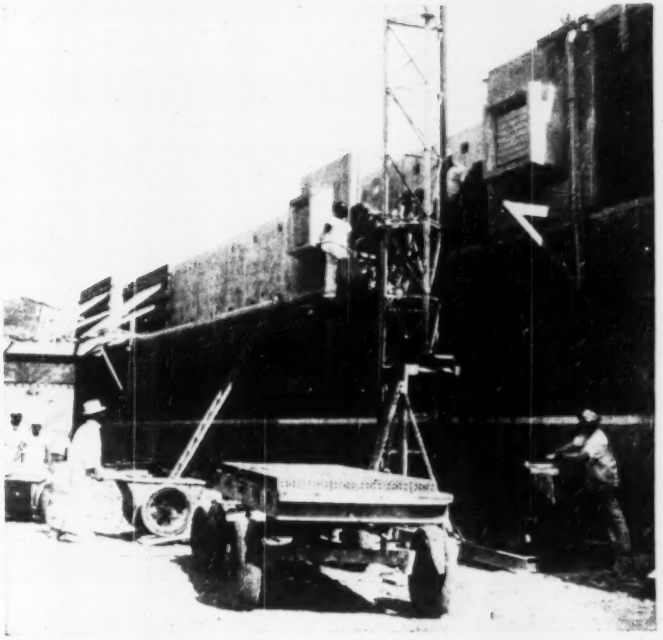
Snap ties hold forms at each of four scale levels. Experience on this job indicates that some tieing system that avoids boring holes for snap ties would prolong the life of the plywood sheets. When bits bore through, they have a tendency to splinter the resin away from the wood on the underside. Cement paste works under the resin for an inch or so, making the resin pull off when forms are stripped. This condition usually occurs only at the first stripping of the underside.

Another peculiarity shows up at the first stripping of a side. Resin on new plywood sheets is clear, so the plywood has a glossy, natural-wood appearance. After concrete has been placed against the surface, the resin turns a dull maroon. The resin also seems to lose brittleness, gain toughness. Vibrator burns affect the surface—however, probably not as much as the burns affect regular plywood. A total of 40,000 sq. ft. of the plywood will be used up on the job, which calls for upward of 600,000 sq. ft. of formed surface.

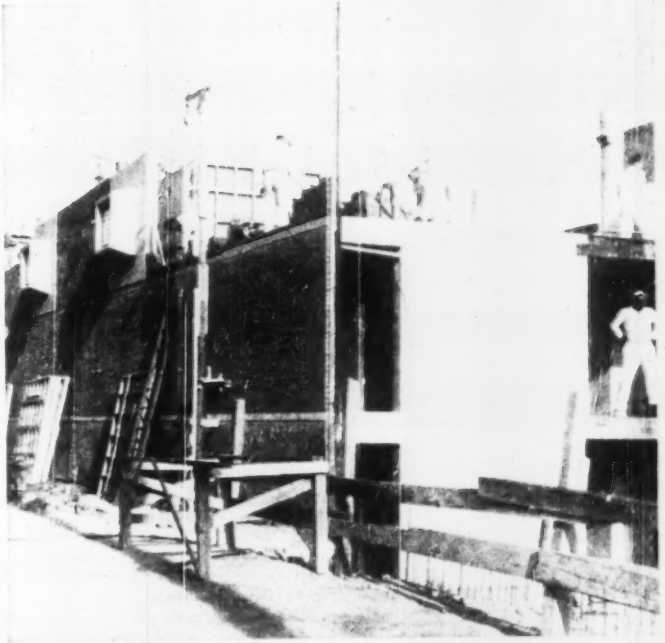
• **Concreting by buggy**—Concrete yardage totals 6,000. Although prison labor is used, so there is nothing but time to be gained with mechanical aids, a few machines are used in concrete mixing and placing. A crane handles aggregates in conjunction with a batch plant at a mixer near the cell-block site's center. A portable platform hoist raises concrete to pouring level. Level hauling, from mixer to hoist and to forms, is by rubber-tired buggy.

• **Precast fan panels**—Another job feature is the construction of 54 fan panels. These are precast in special forms. Plastic-faced plywood sheathing used here, too. Two forms, for alternate use, stand on a single timber casting platform adjacent to the new cell block. When a fan-panel form is stripped, the panel is hoisted to its edge for fan installation then raised to final position at third cell-tier level.

This cell block was designed by George E. Dahl, Dallas architect. Construction is under supervision of Texas Prison System employees: A. G. McKaig, assistant general manager, in charge of prison industries; R. H. Jack, son, engineer; C. H. Combs, construction superintendent.



PORTABLE HOIST raises masonry materials to wall. This hoist also handles concrete for wall and floor placement.



EXTERIOR WALL of each building contains precast exhaust-fan panels at third of four tier levels. Unfinished end reveals story-height pipe chases that extend entire length of building.

FARLEY GANNETT: ". . . salesmen can make good business better."

**The Author Gets the Last Word on . . .**

# Let's Sell Water

The water works industry has a big opportunity to pursue more progressive business policies, wrote Consulting Engineer Farley Gannett in ENGINEERING NEWS-RECORD Nov. 24 1949 p. 39. He plugged for both metered systems to get greater revenues and halt waste, to sighted development of new supplies, and development of new tools for water treatment and supply. But his attention-getting and argument-producing proposal was for aggressive campaigns to sell water—all the water people can be made to buy—on business-like rate schedules.

This direct challenge to "stand pattism" in the industry stirred up plenty of comment by waterworks men. They had their say [illegible] issues of Dec. 8, 1949 p. 24 and Feb. 9, 1950 p. 40.

Now Mr. Gannett picks apart some of the criticisms in this interview.

**ENR: "After Let's Sell Water appeared, did any grape-vine comments about it reach you?"**

**Gannett:** "Yes, they did. Some favorable and some otherwise. Some comments from New Yorkers (which I heard indirectly) were not at all enthusiastic, particularly in view of the city's water shortage.

"May the head of the biggest waterworks group in the country be reported to have said, 'Lucky he's down in Florida now'? When I first wrote the article I was worried about what his attitude toward it would be, as he is a very good friend. I was delighted when I heard of his economic proposal. Doubtless some of his local managers were not pleased with my comments."

**ENR: "Is there any particular comment that you would like to discuss?"**

**Gannett:** "I would like to discuss them all but of course there isn't the time for it. Some, however, need some answering. For example, Mr. DeBerard suggests that my reason for thinking waterworks management is not as good as that of gas and electric utilities is because utility executives and manufacturers work and not golf—and gas properties. My story was not aimed at manufacturers' executives at all but at municipally operated water utility executives. These are usually elected or appointed officials who are generally owned and managed. My point was that operators of such properties do not claim they are managed perfectly. But I know from many years of experience that there are ways to get business and make water properties grow profitably, even though not so rapidly or profitably as gas and electric.

"The traction field, DeBerard also points out, is similarly non-progressive. I agree partially with this but traction and railroad companies have serious troubles which are probably beyond managerial control. The big increase in the number of automobiles on the roads has hit traction companies and railroads hard. The former have replaced trolleys with buses on a large scale, and the latter are changing over to diesel and electric power and improving their rolling stock and trackage. These are well-defined efforts to stop or at least retard what looks like a slowly declining use of their facilities. Without suggesting that the water business is by any means declining, what, I might ask, is the water industry doing to utilize similar innovations to get more business and to do their job better and in a more business-like way?"

**ENR: "Do you agree with Mr. DeBerard that Chicago doesn't need water salesmen?"**

**Gannett:** "No, I certainly do not. Salesmen are seldom taken off the road when business is good. If their employer has anything to sell, salesmen can make good business better. Chicago with Lake Michigan at its door has plenty of raw material to sell and its only problem is to produce sufficient filtered water."

**ENR: "Can you add anything about water metering?"**

**Gannett:** "DeBerard says, in effect, that until installation of meters produces savings in plant operation that more than offset the cost of reading, billing and repairing meters, there won't be any more meters put in Chicago. To my mind there can be no doubt that the South District filter plant has two or three times the capacity it would have needed if consumption from this plant was metered. The same situation will develop when the North Side plant is built. Let's look at another way. If all consumers were metered in Chicago, there would be twice as much water available. And perhaps there would be three times as much for sale to bring in new revenues to pay for filter plants and metering."

**ENR: "What about going after new business?"**

**Gannett:** "Now, that's a good one. One of my early employers, the late James H. Lacries, refused to go after a big waterworks

development engineering job. He said that he never went after a job, that jobs came to him—or else he did not get them. Consulting engineers operated that way two generations ago but they don't do it today. The engineering field, as a result, has expanded vastly not only in the United States but all over the world because American engineers have gone out and sold their services. The water business should do likewise."

**ENR: "How did the suggested peak-load rates for air conditioning and lawn sprinkling strike you?"**

**Gannett:** "I was delighted to have some engineers propose peak-load rates for such abnormal consumption that requires considerable plant investment for short-term use. Some waterworks systems have such charges but they have not been known as peak-demand rates before. And probably most of them are not scientifically determined."

**ENR: "Do you differ with L. F. Ayres' statement that there is no limit to amount of gas and electricity that can be produced, but in great areas of our country, available water supply is limited?"**

**Gannett:** "I disagree with Mr. Ayres because up until a few years ago gas and electricity were limited in certain areas just the way water is today. They were in the wrong places and not where they were most needed. Now natural gas is being piped from Texas, where it originates, to New York and other distant points where it is needed, a feat utterly undreamed of a few years ago. Electricity, likewise, is produced where water power is available or where water supplies are copious, or where fuel is nearby and cheap, and it is transported vast distances to the centers of population. These same principles, which are economic for the electric and gas production and transportation, should be applied to the waterworks business. It's not difficult to conceive of conveying water vast distances, by methods not now employed or perhaps not now known of. Why shouldn't Lake Michigan water, of which there is a vast supply, be delivered to the interior or to our central states where deficiencies are developing? Irrigation water is carried vast distances in pipe lines and canals from large reservoirs to the desert, where almost undreamed of crops are being harvested from formerly barren areas.

"Who would have dreamed fifty years ago that New York would go to the Delaware River eventually for its main water supply or that Boston would go to the Ware River in western Massachusetts, or beyond all, that Los Angeles would go to the Colorado River for its water. These are instances of progressive, far-sighted engineering planning. New York's delay in getting Delaware water was of course held up by legalities and war."

**ENR: "What do you think of W. J. O'Connell's statement that forward-thinking leaders in all centers of concentrated population are concerned with bringing in new industries and expanding those which already exist?"**

**Gannett:** "In my story I indicated that waterworks managers seldom participate in promoting new industries in cities to which they supply water. Other businessmen do that and the waterworks men should be included among them. O'Connell states, 'To such industries, water is a raw material—not a service.' He is entirely correct."

**ENR: "Some of the comments suggest that city officials exert an unhealthy control on waterworks operation. What's your opinion?"**

**Gannett:** "That, I think, is true. E. J. Taylor put his finger on that problem when he wrote, '"Let's Sell Water" should be carefully studied by every waterworks official.' City officials, elected and appointed, are all concerned with waterworks problems. They should take the article to heart because too often it is these men who prevent utilization of business methods by waterworks departments.

"This point is also underscored by John Burgess, who says that the law permits no profit on water in Denver, and therefore there is no fun in being business-like in the Water Department. The city charter stipulates that all savings must be passed along to the consumers."

**ENR: "L. S. Finch of the Indianapolis Water Company must have made a big hit with you."**

**Gannett:** "Indeed he did. His proposal 'Let's sell as much water as possible and pattern the rates to provide the proper return to the utility, possibly through collection of demand charges on unbalanced seasonal loads' is tops. It's just what I tried to say but he said it far better."

**ENR: "What about rain-making?"**

**Gannett:** "The New York newspapers are full of stories about rain-making experiments to fill the city's reservoirs. This gives me a big kick because I pointed out that waterworks men were not taking the lead in developing this new technique. It was the farmers, hydroelectric companies and others who pushed ahead to try out this method of increasing their water supply. Now one waterworks organization gets around to the point of trying to make it work. But let's not overlook the fact that the mayor ordered the experiments."

**ENR: "How do you feel about research in the waterworks field?"**

**Gannett:** "That's a pet peeve of mine. So far as I know, no one is researching for waterworks as is being done in the electric, gas, electronic, physics, chemical, medical and telephone fields. The American Water Works Association should be the agency for this work. It might collect an annual subscription from its members to finance basic waterworks research at various engineering schools.

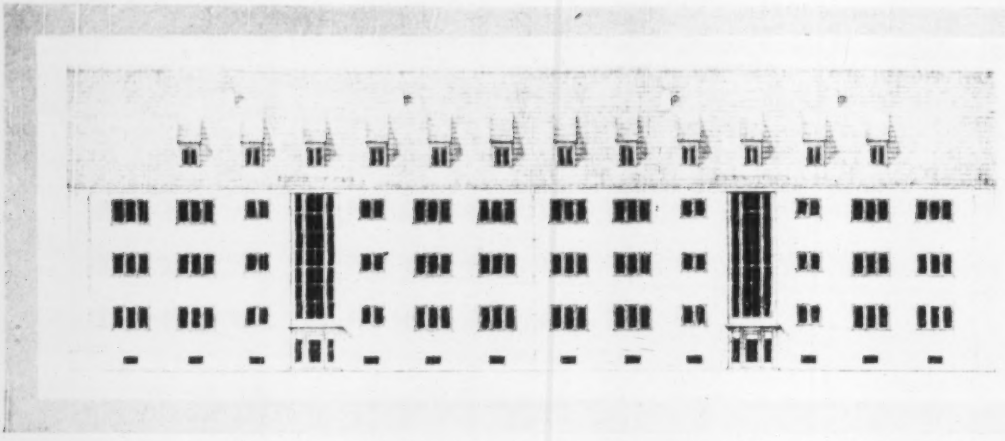
"We need more water. We need pure, soft water. We need to know much more about the health values of water. We need designs that won't let the water freeze or get too warm for palatable drinking. We need cheap, long-distance transport of water. We need more rain and snow in some places at some times, and less in others. We need leakless non-corrosive metal pipes and plumbing fixtures and valves that don't crack or stick. We need meters that register correctly and automatically print the correct reading on a card to eliminate human error. We need cheaper water storage, cheaper dam spillways and lower overhead costs all along the line. There's no end to the problems on which we can put the research laboratory to work."

## B&O Training Program Takes 4 C.E. Graduates

Four civil engineering graduates were among eight young engineers selected recently by the Baltimore & Ohio Railroad for its first Technical Graduate Training Course.

The course will consist of 150 weeks of training in all phases of railroad engineering. It's designed to train engineering graduates for supervisory positions. The first 60 weeks will be spent in the five principal departments—Engineering, Maintenance of Way, Communications and Signals, Motive Power and Operations. The remaining 90 weeks will be spent in specialized training.

The civil engineering graduates chosen from more than 100 applicants are W. H. Viets, University of Vermont, 1950; R. G. Rayburn, Purdue, 1949; G. J. Cavanaugh, Bucknell, 1950; and L. B. Waterman, Carnegie Tech, 1950.



OVER 300 OF THESE BUILDINGS will be built in 40 German communities to house families of U. S. Occupation Forces. They

# New Housing for the Occupation Army

Lt. Col. Robert E. Snetzer
Chief of Construction, Engineer Division
European Command

WITH CHANGING CONDITIONS in the American Zone of Germany, some new problems have been posed for the engineers of the occupation forces. One of the most interesting relates to the housing of U. S. troops and dependent families in a more standardized type apartment building.

About 150 of these new buildings, each providing 12 apartments, have been placed under construction since Spring. The program calls for 180 more. Located in 40 different towns and villages, these new buildings will provide a total of 4,000 individual living units.

Two principal conditions made the new housing necessary. (1) As the occupation has settled down into U. S. families have come to Germany, and (2) with a long occupation in prospect housing equivalent to U. S. minimum standards became mandatory. Presently requisitioned housing, in addition to being needed by the Germans, does not in many cases meet these standards.

Efforts to provide more living space were begun by converting former German troop barracks to family housing and by renovating structures originally considered uninhabitable. In addition, during the summer of 1949 two projects were started in cooperation with local German agencies to build new family apartments, which would be requisitioned by the Occupation Forces upon completion. Later, two additional new housing projects were started under direct supervision of the Corps of Engineers. But the total of these efforts did not suffice, and on Dec. 1, 1949 the Chief Engineer, Headquarters, European Command, was directed to develop a standardized type apartment building.

## How the Plans Were Developed

Based on the experience gained from housing projects already underway, a complete set of design criteria, guide specification and general plans were developed. A plan for a building containing 12 family units, four apartments to each floor, with half of the units having three bedrooms and the other half two bedrooms, was adopted. The size of the apartments averages 1,500 sq. ft.

With the guide specifications and general plans approved by Headquarters, EUCOM, the Engineer Division obtained the services of a German architectural firm to draw up the construction drawings, complete specifications and bills of material in German. The firm, chosen from several well known German architectural offices, had already done considerable work for the occupation forces and was familiar with American requirements.

The standard plans and specifications had to be drawn up in both German and English. However, since the actual construction is done by German construction firms, the German specifications govern. The metric system of measure is used exclusively on the construction drawings.

**Bidding Practice**—Bids or proposals are submitted with each individual paragraph of the specifications. In turn, all bills for payments presented by construction firms or their subcontractors are submitted as portions of these actual specifications. This insures that the bill presented and paid is for the exact items intended inasmuch as they are completely described. The combined bill of quantities and specifications for one standard building totals more than 250 typewritten pages.

**Contracting Procedure**—Current methods of carrying on so-called "contracting" in a military occupation are of interest. Business is done by use of a legal instrument known as the Requisition Demand and its counterpart the Requisition Receipt. This Requisition Demand is served on a German contractor, requiring him to perform the work in the manner stated in the conditions and specifications, which become a part of the Requisition Demand that the contractor receives.

In actual practice the Requisition Demand is served on the best-qualified construction firm, that has expressed a desire to do the work and has submitted a proposal to do the specified construction for the least amount of money.

When the work has been satisfactorily completed the contractor is given a Requisition Receipt. This document is presented to the local occupation cost office, which pays him the actual Deutsche marks specified.

will revert to the German government.

Partial payments are made in the same manner.

The Standard Apartment Building is a wall-bearing masonry structure of brick, concrete block or poured rubble concrete, with walls approximately 15 in. thick. Walls are stuccoed on the outside and plastered on the inside. Structural floors are of hollow tile construction, plastered on the underside and with wood or terrazzo floor laid on top. Inside walls and partitions are of brick or hollow pumice block construction, plastered. Standard German-type tile roofing laid on wooden purlins supported by heavy timber or steel rafters is used. A central hot water heating system is installed in each individual building.

Standard American facilities have been included. Complete built-in cupboards, work benches and a built-in sink are provided in the kitchen in contrast to the usual German practice of pantries, kitchen tables and an old fashioned movable kitchen cupboard. Ample built-in closet space has been provided throughout the apartments rather than the common movable furniture type wardrobes used in German housing. Much heavier electrical wiring than is common in Germany has been installed because of the American families' use of more electrical appliances and more light.

The resulting buildings are a combination of American and German ideas and available German materials and construction methods. Millwork, in general, is done at the job. Plywood is used to the maximum. All windows are casement type with double glass or a single frame making a combination storm and regular window. Double-hung sash windows are not used in Germany. Window screens are a special "job-built" item, for their use is uncommon in German construction practice. The venting of the plumbing to the roof has not been practiced in Germany, and this American requirement has met some objection from German firms unfamiliar with its purpose.

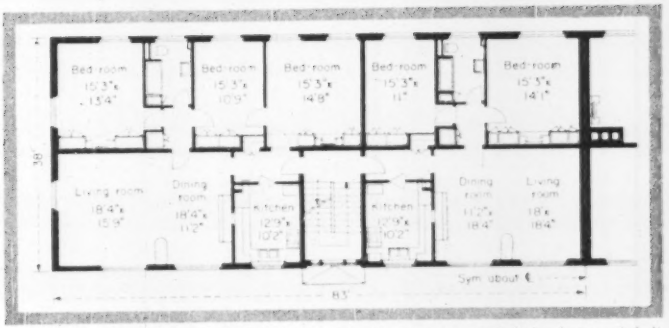
With the ratio of labor cost to material cost reversed in Germany in comparison to the United States, certain luxury-type construction becomes common practice here. Parquet flooring laid with small wooden splines is used exclusively in all rooms other than kitchen and bath. Long strips of tongue-and-groove flooring commonly used in the United States is too expensive in Europe. Terrazzo flooring is used in kitchen, baths and all common hallways and stairs because it is more economical than other types of suitable flooring. Large areas of hand-set tile are used because of their relative economy.

Some common American construction practices are avoided entirely because of lack of certain items in the German economy. Linoleum, for example, cannot be used because it is not an item produced with raw materials available in Germany. No American material goes into the construction of these buildings.

**Germans will get them eventually**

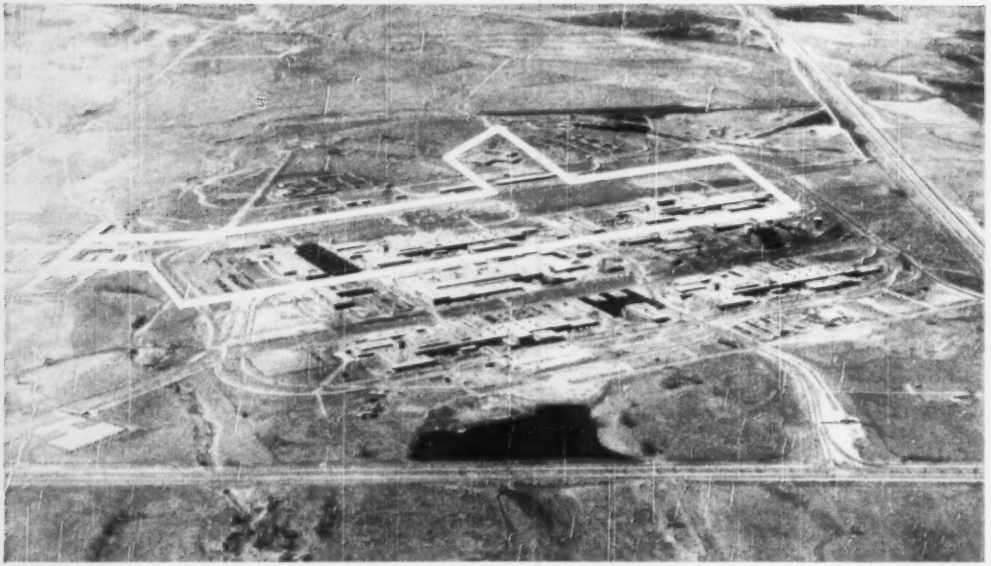
The apartments are designed for a life of 70 to 100 years, which is normal German practice. When the need for them by the occupation forces ends, they will revert to the German government.

The design is so worked out that the comparatively large apartments required for American use can be divided to make 18 instead of 12 family units per standard building. The design provides for additional chimneys in the buildings to permit individual stove heat by future German occupants. These were inserted at the express request of the German authorities. Since these buildings represent a permanent capital asset to the German economy and will ultimately revert to the Germans, the cost of construction is entirely borne by the German government and is not charged against the cost of occupation.




AMERICAN housing standards plus German building practices ruled the design. A built plan of one floor is shown.

GERMAN firms do the actual construction under German specifications.



THE BUREAU OF RECLAMATION will occupy the building in the part of the Denver Federal Center outlined in white.

# Bureau of Reclamation Concentrates Engineering Facilities at Denver

Concentrates, what it believes to be the finest collection of engineering laboratory and testing equipment and its top level engineering brains in one place, the Bureau of Reclamation will formally operate new Engineering Center at Denver, Colo., July 20.

The bureau will occupy two huge buildings and six small ones totaling 500,000 sq ft of floor area, and nearly one half of the industrial area which in total comprises the Denver Federal Center, 9 miles west of downtown Denver at the base of the Rocky Mountains. The project, built and operated as a small arms plant during the war, has been taken over by the federal government as a central point for its operations covering the 17 western states.

Conversion of the war plant into an engineering and research laboratory was started in April, 1946, and was completed in 1947 at a total cost of $1,800,000. Since then, installation of modern equipment has been in progress.

• **Big testing machine**—Among the exhibits to be shown to the public, following the dedication ceremonies, is a mammoth universal testing machine of 5,000,000-lb capacity, either in tension or compression. Only one other such machine in the country is larger. The Bureau of Standards' testing machine in Washington, D. C., has a capacity of 10,000,000 lb, but in compression only.

The bureau's big testing machine in Denver also can handle specimens 32 ft long. By comparison, the Portland Cement Association's new laboratory near Chicago, described June 8 ENR, p. 32, contains a 1,000,000-lb testing machine that can handle specimens 30 ft long.

The existing hardwood flooring where the machine is located was replaced with concrete, foundation for the 750,000-lb apparatus was carried to rock and insulated from the rest of the building, also to a great height of the roof.

The testing machine is located in Building 1B at extreme right in picture. The design and service branches are in Building 1A. To supply water for hydraulic testing, an underground reservoir and recirculation system was installed under 1B.

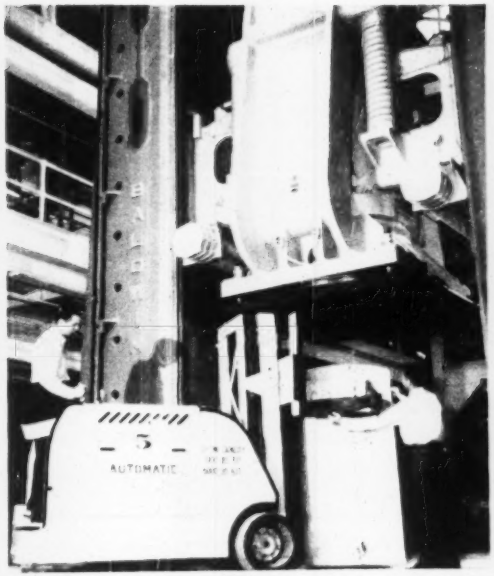
Models built to exact scale for the study of the design and operation of dams, gates, spillways, flumes and other matters as a part of the regular work of the Engineering Center will be demonstrated.

The main engineering laboratory building (known as Building 1B) is a long narrow structure, with several wings on both east and west sides. Its ground floor will contain a machine shop, and nearly half of its main floor will be devoted to materials testing and structural research.

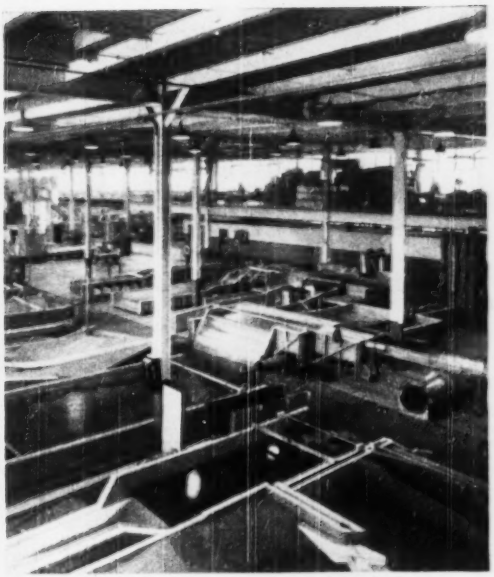
Hydraulics will occupy the other half of the main floor along with chemical engineering and administrative offices. A mezzanine floor will house a plastics and instruments shop, a structural research and geology office and other offices.

The bureau now employs 2,178 at the center, and does not plan to increase its staff at present. About three-fourths of the total employees are in the design and construction branch.

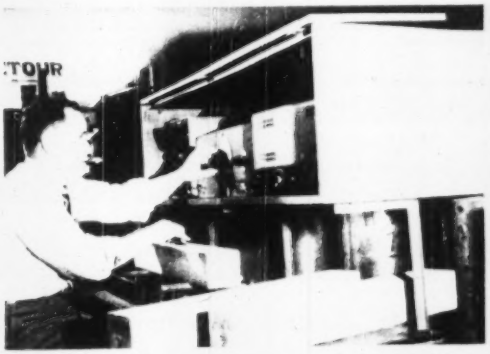
With its enlarged facilities, the bureau is now able to do research testing and designing for other government agencies and for foreign governments. The center's library contains 2,000 volumes and 150,000 pieces of technical data and references; special equipment (such as photoelastic instrumentation) is already credited with saving $25,000,000 on bureau construction jobs.

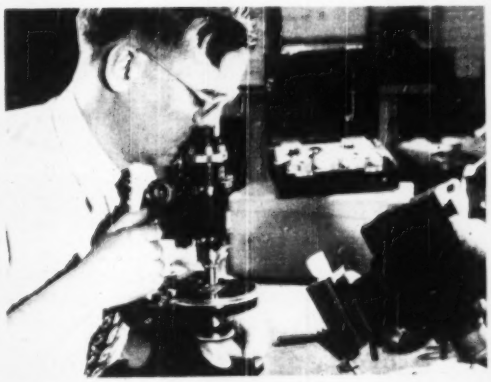


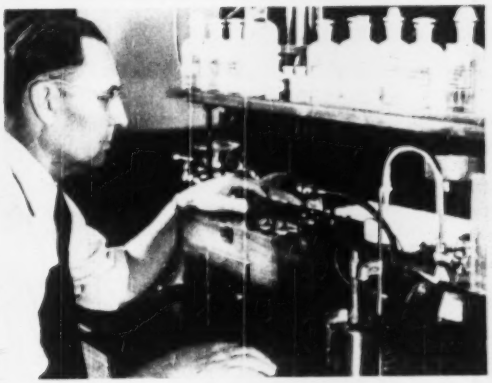

BIG BLOCK BUSTER—of 5,000,000-lb capacity in tension or compression—can handle test specimens up to 32 ft long.



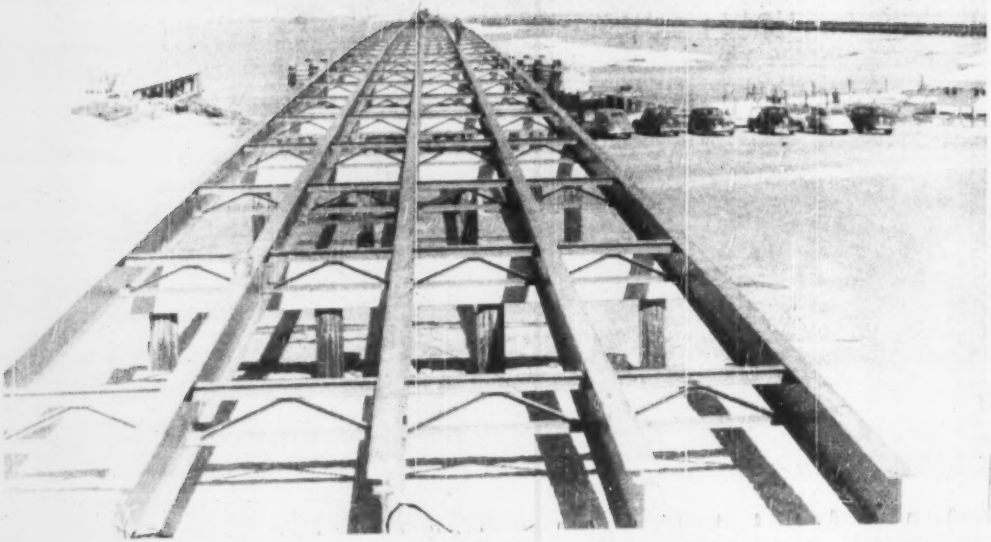
A MULTITUDE of model studies will be carried out in the new hydraulics laboratory, a converted wartime small arms plant.







TYPICAL of the experimental work to be performed are: Modulus of elasticity of concrete specimens determined quickly by dynamic equipment (top left); rapid quantitative analysis of a cement sample by a flame photometer (top right); examination of concrete cores under a petrographic microscope (bottom left); alkalinity of soil samples by electrical pH meter (bottom right).



STRINGERS for Nueces Bay Causeway, Corpus Christi (ENR Mar 9, p 28) were spliced by welding. And the diaphragms were fabricated and erected by welding. It took many years and much effort to get contractors to bid favorably on such construction.

# Texas' Experience with Welded Bridges

Randle B. Alexander
Bridge Engineer
Texas Highway Dept.
Austin, Texas

UNIT PRICES bid on current bridge jobs in Texas for structural steel erected have been running about the same for welding and riveting. Since the welded designs call for smaller tonnages, offering of a welded alternate is saving money. But texts not always that. The Texas highway department worked hard for many years to bring this about.

Many advocates of structural welding appear to be disappointed over the slowness at which the construction industry is embracing welding for primary steel members (ENR Dec 15, 1949, p 25; Feb 2, p 112; Feb 9, p 116; and Feb 16, p 152). We in Texas believe there is not too much cause for alarm in this respect. In fact it might be argued even by those of us who favor welding, that the industry is adopting it at a fast pace.

This would be true in the case of designers who are sold on the idea and who begin to produce welded designs without first becoming thoroughly grounded in its principles. And the results would frequently discourage a fabricator attempted a complicated welded structure without sufficient personnel experienced in this type of work.

We have promoted structural welding on Texas highway bridges with a great deal of zeal since the war, and we have been as cognizant as others over the resistance we have encountered. It is quite likely that some of our welded designs may be proved impractical by future experience. But we have had a fair measure of success to date, and I wish to submit the following record of our experience.

• Personnel schooled. Immediately following the war we were of the opinion that welding had come of age. We believed that the great strides made during the war in welding and the development of new techniques together with the many new welders and the greatly increased number of qualified welders indicated that postwar construction would adopt welding as being more economical than riveting. Also, there were good chances that welding might prove superior to riveting from a structural standpoint.

In an effort to keep abreast of developments, the Bridge Division conducted a welding school for the benefit of key personnel. Following this, we revised plans and specifications to permit welding as an alternate to riveting in several instances of standard construction, and we began the development of plans for particular welded jobs.

• Bidders ignored welding. Texas bridge engineers had a large number of bridges of continuous I-beam construction, in which the beams are spliced at points of maximum stress. For nearly two years all these splices were offered with a welded alternate—but not one was built with the welded splice.

In the same period, a few plate-girder jobs went to contract specifying certain incidental welded items, such as web stiffeners, bracing and cover plates. Fabricators seemed to abhor these details. They requested permission to change to riveted construction, thereby losing the economy in poundage of steel

in their own costs. They were permitted to make these substitutions, and we became very reluctant to specify welded construction. For a time, the welded alternate for I-beam splices was removed from standard plans.

At this point, we began to realize that many of our contractors and fabricators had never had an opportunity to investigate the possibilities offered by welding. They were being asked to bid on a method about which they knew nothing, in competition with a method with which they were familiar. Consequently, they always elected riveted construction.

• **Welding introduced**—We decided it was time to force the issue, and offered several jobs on which welding was specified and no alternate permitted.

The results were gratifying. Most of the contractors who built these jobs were pleased with the cost and simplicity of the construction procedures. We were eventually able to go back to the previous practice of offering welded and riveted alternates.

On six comparatively recent jobs, where the contractors were allowed the two options for beam splices, welding has been elected. On one of these jobs, the plans required that splice plates for the riveted alternate be furnished at the contractor's expense; on the other five jobs, the splice plates would have been paid for had the riveted alternate been elected.

We have completed 27 projects on which there are one or more structures of continuous I-beam construction and on which the beam splices were made by butt welding. Eleven other such projects are under contract. A large number of bridges have been built on which a substantial amount of field welding other than beam splices has been used. In fact, we have been field welding the diaphragms on I-beam construction, with very few exceptions, for the past eight years.

• **Effect on prices**—We have never been able to determine the influence of welded construction on the over all bid price for structural steel. The efficiency of labor in certain localities, peculiarity of the bridge site, amount of competition, and the method of balancing bids all serve to influence bid prices.

There is some indication, however, that all-welded construction is at least no more expensive than all-riveted construction on a per pound price basis. We recently awarded a contract for an all-welded plate girder, and the bid price of 10.8 ¢ per lb for erected steel appears to be slightly less than would have been expected for an all-riveted job. The principal saving here, however, was in the reduction in weight of structural steel.

We are concerned about the fatigue strength of welded joints, and as mentioned above have located welded butt splices consistently at points of minimum stress. Welded diaphragms, however, are subjected to higher stresses. Although our welded bridges have not been in service more than a few years, it is possible that some of these may have been subjected to several thousand load repetitions. We also realize that some of our structures may not have had expert inspection and that, even though qualification of welders is required, some of the welding may possibly be substandard. In view of these possibilities, we have elected to make a detailed inspection of all our welded structures this summer.

# Notes on Legal Decisions

**Summaries of decisions relating to construction prepared by I. Vernon Werbin, counselor at law and engineer, New York, author of Legal Phases of Construction Contracts (McGraw-Hill)**

## Corporate Contractors

A corporation, as a general rule, has no authority to do business other than in the state of its incorporation, unless it obtains authority to do business in such other state.[1] The question often arises as to what constitutes doing business.

The mere submission of a bid is not ordinarily regarded as doing business.[2] However, once the bid has been accepted, the corporation should obtain authority to do business in that state.

In one case the contract was held to be void and unenforceable where the contractor delayed in obtaining authority to do business until the job was two-thirds completed.[3]

There are four states—Alabama, Arizona, New Mexico, and Virginia—where a corporation must obtain a license before it can engage in the contracting business. In the following states—Colorado, Florida, South Dakota, Utah, Washington, Virginia and Wisconsin—a foreign corporation must obtain authority to do business in those states before it can acquire or hold personal property in those states.

[1] See [illegible]
[2] [illegible]
[3] [illegible]

## Impossibility of Performance

"Impossibility of performing a promise that is not due to the nature of the performance, but wholly to the inability of the individual promisor, neither prevents the formation of a contract nor discharges a duty created by it."[1]

The impossibility must consist in the nature of the thing to be done and not in the inability to do it. If performance is not inherently impossible, and there is an unconditional promise to perform, nonperformance is a breach, where the obligor becomes unable to perform, even though through causes beyond his control, since he might have provided against them in the terms of his contract.

Where performance depends upon the continued existence of a given thing and such continued existence is assumed as a basis of the agreement, an implied condition that such existence shall continue is to be read into the contract, and the destruction of the thing puts an end to the contract.

Where the performance of a contract depends upon the happening of an event over which neither party has control, an implied condition will be read into the contract that it shall be abrogated on the non-happening of such event. The event which renders the contract incapable of performance is the cessation or nonexistence of an express condition or state of things going to the root of the contract.

Where an event substantially frustrates the objects contemplated by the parties when they enter into the contract, the foundation of the contract is gone.[2]

[1] [illegible]
[2] [illegible]

## Waiver of Contract

An oral waiver of the terms of a written contract must be clear, positive and above suspicion and cannot be proven by loose casual conversation. The party asserting a modification of a contract has the burden of proving the waiver. He must demonstrate that the minds of the parties definitely met on the alteration. This burden is not sustained by merely showing that the adverse party failed to protest the change. The doing of what one is legally bound to do cannot constitute a consideration to sustain a promise.[1]

[1] [illegible]

# Upward Mining of Cut-Off Trenches

## . . . Required by leaky shale abutments at Mount Morris Dam

CURTAIN WALLS reaching 80 to 150 ft into the shale abutments of Mt. Morris Dam will prevent leakage around the structure through clay-filled joints in the rock. A 6-ft thick concrete cut-off wall, with built-in galleries for grouting and drainage, is being poured in each side of a 300-ft gorge on the Genesee River.

Topography at the site of the flood control structure, 40 miles south of Rochester, N. Y., is ideal. The single-purpose structure, 250 ft high, will store 337,000 acre-ft before diverting flood waters over its 550-ft uncontrolled spillway. Towns and farms downstream will be spared the inundations of the past as the northward-flowing stream discharges into Lake Ontario.

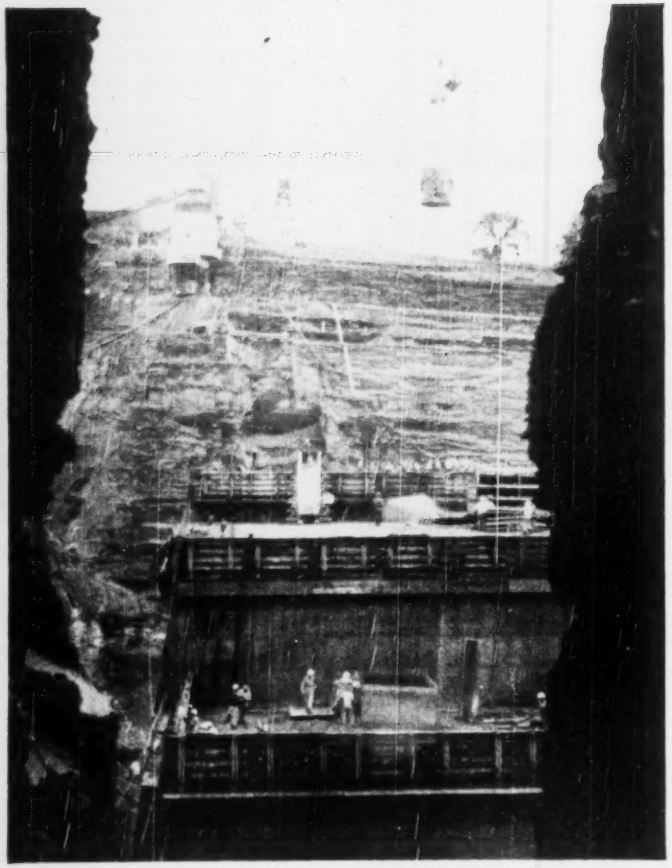
Geology at the site is not so ideal. Half a dozen types of shale in horizontal strata form the gorge walls. Fortunately across the bottom of the gorge (at El. 545) there is a 2-ft thick layer of limestone underlaid with solid shale. The dam is founded on this limestone at about El. 544.

• **Leakage real danger**—The gorge walls are satisfactory structurally as abutments. But they won't hold water and grouting alone won't make them watertight.

Near vertical joint seams parallel the river at variable distances back in the rock. These clay-filled joints would make excellent channels for flow around the dam at not cut-off.

Specifications call for extension of curtain walls at least 20 ft beyond the farthest seam from the river. Thus depths to which cut-offs pierce the abutments vary up to 150 ft. In height, they will extend from the bottom of the dam to its top.

Construction of the curtain walls—excavation of narrow slots in the rock and subsequent concreting—is progressing in both abutments as the dam itself is moved into its peak year of concreting.



A SIX-FOOT SLOT is being cut and concreted in each wall of the 300-ft deep Genesee River gorge. Here construction activity on the $24,000,000 dam is viewed from within the right abutment. The cableways' head tower and the concrete plant stand near the opposite bank of the gorge.—ENR Staff Photo

• **Cut-off methods**—The construction process in the curtain wall is this:

First, a tunnel is driven back into the abutment to a depth 20 ft beyond the farthest rock fault. It is 6 ft wide and about 7 ft high—enough to provide headroom for the work to follow.

Next, the roof of this drift is line-drilled along each side, loaded with charges in two rows of drill holes down its center, and shot. The load holes are 12 in. dia, drilled 5 ft into the roof, and each is loaded with 14 lb of explosive.

This roof drilling and blasting overhead stopes is repeated by men working on an increasingly thick blanket of unexcavated rock. When they have worked themselves up some 35 ft, they move into the slot to complete excavation and concrete is poured to within about 7 ft of its top—again leaving work space for repetition of the entire process.

The 5 ft of roof that drops with each blast becomes more than 5 ft of muck on the tunnel floor, so enough must be dragged out to maintain the 7-ft working headroom.

A maximum of 50 ft unsupported vertically has been specified for the stope drilling, for roof and high slot of only 6 ft width might collapse in a wall. Keeping the height well under this maximum, the Corps of Engineers' crew has been able to detect no movement of slot walls.

• **Drilling pattern**—The drill pattern in the tunnel roof is this:

Line drill holes 5 ft deep are on 6-in centers in two rows 6 ft apart. Load

holes are spaced about 4 ft apart in each direction, being spotted in pairs along the entire length of the roof's centerline. A variation in this pattern occurs at the point where widening is necessary for forming the curtain wall gallery.

• **Blast Timing**—The whole length of roof—from gorge wall in to deepest point of cut-off penetration—is dropped in one delayed timing blast—with one-second delays between shots. Shots are timed so that the four zero holes that go off first are midway in the drift. Shots numbered 1 (one second after the zero shot) are in the pairs of holes either side of center. And subsequent shots are similarly numbered in both directions from center, with the one-second delay between numbered shots maintained through out. The effect of this delayed blasting is to drop a wedge out of the roof midway back in the tunnel as a starter, then work in both directions from it.

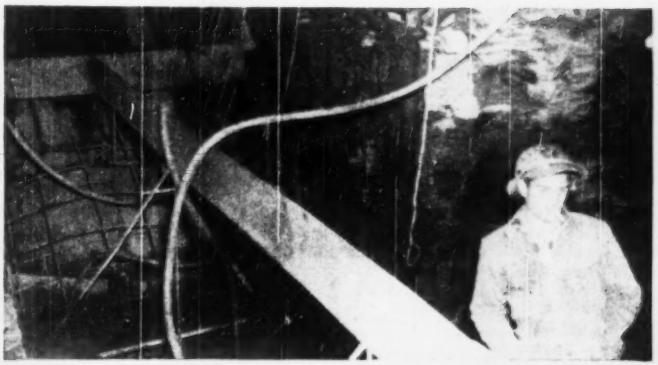
Mucking is done with a dragline pulled by the winch on a tractor parked outside the hole. Muck is dragged out of the slot in the right abutment to where it can be loaded in a skip and removed by one of the twin 20-ton cableways (first used at Shasta Dam) handling materials on the dam.

At the left abutment, the contractor has built a roadway along the sheer rock face as access to the cut-off, so that he can haul muck away by rear-dump truck. This roadway is built of parts from the contractor's now dismantled access bridge across the river. With the dam in its present stage, the downstream crossing had no further use—catwalks on the dam's downstream face carry workers, and materials go by cableway.

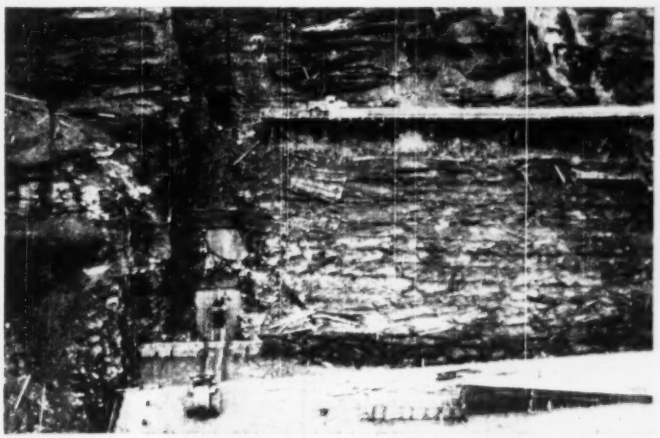
• **Concrete pumped**—Once a section of cut-off excavation has been completely mucked out, it is concreted through an 8-in. pump line. The only formwork necessary is that which closes the slot at the abutment face and the circular sections that form the curtain wall gallery.

These gallery forms angle upward through the curtain wall (at a 1 to 1 slope in the right bank, 0.75 to 1 in the left) in a 13-ft dia barrel cut in the rock. Their 9-ft dia leaves a 2-ft thickness of concrete around the gallery. This is reinforced with two concentric grids of ¾-in. bars on 12-in. centers both ways.

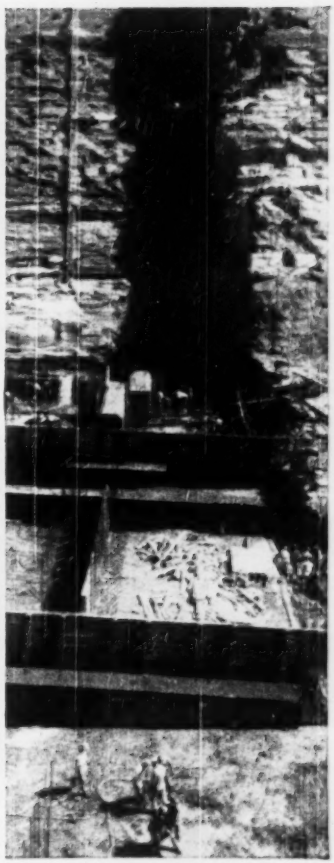
The sloping galleries are formed and



FORMWORK AND REINFORCING inside the slot is limited to the circular grouting gallery (left). Steel-plate water stop 12 in. wide and ¼-in. thick joins pours.



AT THE LEFT ABUTMENT the contractor has hung a roadway on the steep rock face to the cut-off excavation for hauling muck away. Tractor (lower left) drags enough muck from slot so drilling can proceed. At lower right may be seen formwork for one of nine 5x7-ft. sluices that will pass normal river flow.



RIGHT ABUTMENT—Cut-off slot is shown cleaned out and ready for concrete. The grouting gallery changes to a circular section within the cut-off wall.

PRESENT DIVERSION STAGE has river flowing over two low blocks while work on stilling basin and blocks behind cofferdam is being pushed. Later, river will flow through sluices being formed in blocks at right while present diversion channels are concreted.

poned with stays from bottom to top, and grout pipes are set for later grouting of rock below the cutoff. A level access tunnel will reach each curtain wall gallery from the top of the dam. At their bottoms, the galleries join the usual grouting tunnel which extends all the way across the dam.

• **Leak control**—Water stops between individual pours in each curtain wall are rigid, 12-in. wide steel plate, ¼ in. thick. Between the curtain walls and the dam proper, a flexible 24-oz copper water stop 18 in. wide is used.

Also between curtain walls and dam is a 2-in. joint, filled with a bituplastic, sheet insulating material. This watertight joint will allow future movement of the dam anticipated at about ½ in. downward, without structural failure and consequent leakage where it meets the curtain walls.

• **Dam dimensions**—Viewed in cross section, the curtain wall is located on the dam's axis, which is 25 ft back from the upstream face at the base and right at that face at the top.

Top of dam width is 20 ft; length is 1,003 ft. At design flood +520 msl elev there will be 2 ft freeboard at the non-overflow ends of the dam. Altogether the structure will take 7,700,000 cu yd of concrete. Rock excavation will total 500,000 cu yd.

• **Penstocks later, maybe**—Although the project is for flood control, two openings for 45-ft penstocks are being formed through the left end of the dam to facilitate power development at a later date should flood storage be provided by other dams farther upstream. These openings are being bulkheaded with reinforced concrete.

There will be no appreciable pool the powerless for other purposes according to the present plan of operation. Nine 5-ft x 7-ft sluices controlled by pairs of hydraulically operated slide gates come to service, the other for emergency, will pass normal river flow without much storage being formed. They will pass up to 27,700 cfs before the pool reaches spillway crest.

An elevator from the operating tower at the spillway's right end and a catwalk at its left end will give access to an upper gallery just under the spillway crest, the operating gallery where radial gates will be controlled, and the grouting gallery.

• **Progress report**—At present about 850,000 cu yd of concrete have been poured and construction is in second stage of river diversion. The stream is flowing over two low blocks near the right bank. A cellular steel cofferdam ring the structure's first half, where dam connecting is getting well off the rock up around the discharge conduits and stilling basin is near completion.

The center of hopes to hit his concreting peak this summer, as the latter can be increased from 12,000 cu yd as the dam rises and formwork at the sluices is passed.

Completion of the present $20,400,000 contract is scheduled for July, 1952. Concreting shut down last winter from Thanksgiving until March 21, and will do about the same this year and next.

With future grouting costs, land acquisition and clearing added to the prime contract price, total cost of the project becomes about $24 million.

Joint ventures building the dam are: The Arundel Corp., J. C. Maguire, Shotner, Gordon & Hannah; the Hunkin-Conkey Construction Co.; and L. F. Dixon Co.

W. V. Greely is their project manager. Frank Bryant is superintendent and Ray Martin chief engineer. Jack E. Hims is the Corps of Engineers' resident engineer, Hugh Kenner is his assistant.

Design was done in the Buffalo District office by Bernard R. Fuller, Col. Frank H. Forney is district engineer. A board of consultants assisted in planning, it consisted of the late Joel D. Justin, William F. Creager of Burns & McDonnell, Kansas City, Mo.; J. L. Hayes of Chicago; and W. H. MacAlpine and Benton W. Steele, both of the Chief's Office, Corps of Engineers. Spillway and stilling basin design studies were done with models at Case School of Applied Science under Prof. George L. Barnes.

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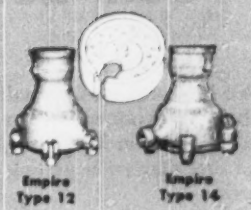

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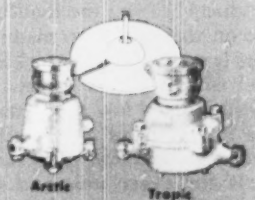

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Davis Construction Company, Hicksville, N. Y., has recently completed the new Veterans Memorial Highway between Commack and Patchogue, L. I. The photographs show part of the Davis earth-moving equipment on this job. Cost of the new through-way, $1,500,000.

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# READER COMMENT

## More Power at Niagara

SIR: When I read the editorial entitled "More Power at Niagara" in the June 15 issue of the Engineering News Record, I was reminded of John T. Flynn's book "The Road Ahead".

Mr. Flynn strongly defends our American free-enterprise system and justly so. However, notwithstanding how much our free-enterprising system is worth defending, and it is, it has had its abuses and has made mistakes thereby aiding its enemies and those that would weaken or destroy it.

One of the fundamental principles of law is *that one should go into court* with as clean hands as possible. Mr. Flynn nowhere suggests the strengthening of our free-enterprise system by the elimination of any such abuses and mistakes. His attitude is, "The King can do no wrong." Why not set our own house in order and thereby strengthen it?

What has this to do with the power at the Niagara? Just this, this power belongs to the people of the state of New York in perpetuity and therefore should not be exploited by private interests at the expense of the people, the owners.

Fundamentally, this is not a question of public or private power development. It is a question of whether the people, the owners, keep absolute control of its own property and reap the full benefits or whether, under the guise of free-enterprise, private interests use the power that belongs to the people for its own benefits, and the people, the owners, receive only a part of the benefits.

The Niagara Mohawk Power Corp. tells of the millions that it would pay in taxes but from whom do they expect to get this money and much more? My own city of Watertown, New York, the owner of water power, has been through a similar situation and we have profited much more by keeping, developing and selling our own power, as well as taking care of our own requirements. Our surplus is sold to the Niagara Mohawk Power Corp.

In 1914, Theodore Roosevelt said: "You have in this section a most valuable asset in your natural water power. You elected too many men in the past who have taken what belongs to the nation. Do not let them get a monopoly on what belongs to the state. Do not give up your water power for a promise of future development. We are poor citizens if we allow the things worth most to get into the hands of a few." Theodore Roosevelt's advice is just as pertinent today.

The state of New York is as capable of developing their own power as efficiently as any other interest and, if advantageous, such power could then be distributed to the public through arrangements made with existing private facilities.

Regardless of what procedure is followed, the cost is borne by the people. The question of cost is, how much and what do we get for it.

The primary duty and obligation of any trustee is to conserve and protect the owner's interests.

WILLIAM E. FIELD,
*Consulting Engineer,*
*Watertown, N. Y.*

EDITOR'S NOTE: The editorial discussed by Mr. Field favored the application by the Niagara Mohawk Power Corp. for a license to use the additional water that soon will be available at Niagara Falls for power development. Under such a license, the government can take over the plant in which the water is used at the end of the license period, just as it can take over the existing plants of the power company under the license by which it is now taking water from the Niagara River. And as the Public Service Commission regulates the rates the company charges for power, it would appear that the "owner's interests" are fully protected.

## Small-Contractor Problems

SIR: A serious problem that now confronts engineers, architects and contractors is one that is peculiar to smaller communities, particularly those adjacent to the larger cities. It concerns union jurisdiction.

Smaller contractors are for the most part non-union. Especially in the affiliated trades—heating, plumbing, electrical—they are usually small organizations in which the owner actively works at his trade with one or two skilled assistants.

And here's the problem:

In a specific instance, work is now suspended on a public building because of a picket line put into effect by the electrical workers union.

The general contract (approximately $100,000) was awarded to a union bidder as lowest and best bidder. The plumbing and heating contract was also awarded to a union bidder (about $17,000).

The electrical contract ($4,800) was awarded to a non-union bidder, as lowest, best and only bidder. This firm consists of two brothers and their father, no other personnel.

The day the electrical contractor started to work, the electrical union threw a picket line on the job, and the workers under the general contract and the plumbing and heating contract refused to cross.

Now here is the problem:

The electrical workers had a legal right to picket. The non-union contractor had the legal right to bid the job. The allied trades workers had the legal right to walk off the job. The owner (a village) had allocated all the voted funds to specific requirements of the structure.

The injured parties, of course, are the union contractors and the village.

This specific case is one of several already developed and there are more to come. Advice from a hard-bitten engineer is for architects and engineers to advertise for general contracts only, and for this contract to cover all work on the improvement. Then, union or non-union, it will be built.

OTTO HISES
*Consulting Engineer*
*Toledo, Ohio*

## Consultants as Arbitrators

SIR: Your editorial (ENR, June 1, 1950, p. 21), entitled "Consultants Are Necessary", is good, as well as timely.

May I add one thought—a consulting engineer with experience in design, construction, administration, and public works offices, is often called in to harmonize divergencies of opinion between engineering staffs and presidents of corporations. Many times he acts as a one-man arbitration board between contractors and either city, county, state or federal boards.

With an outside, disinterested viewpoint, unhampered by inhibitions of working entirely for a corporation or bureau, the consultant can sometimes see clearly the answer to some moot point which might escape an even more competent engineer who has had his eyes and nose too close to that individual problem for too long a time.

ROBERT B. BROOKS
*Consulting Engineer*
*St. Louis, Mo.*

## Rail Removal Costs

The cost of removing street car rails from pavements in Chicago by the method described in our issue of June 29, p. 43, ranged from $1.50 to $2.00 PER FOOT OF TRACK (both rails). These amounts were given in that article as the cost per mile, which obviously was in error.—EDITORS

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# DEVELOPMENTS ABROAD

## Rio claims world's biggest stadium

What proud Brazilians claim is the world's largest football stadium is now open for business in Rio de Janeiro.

The stadium, a huge circular four-deck affair that can seat an estimated 120,000 persons and stand another 30,000 spectators, was completed just in time for the start of a world soccer tournament on June 24.

The structure is built of reinforced concrete in the Derby Club section of Rio, ten minutes by car from the heart of the city and very close to two main railway terminals. Started in 1948, it is said to have cost about $20,000,000, and will accommodate even the football tournament soccer, basket ball courts, a mass gymnastics field, tennis courts, swimming pools and an orchestra shell.

A typical South American feature is installation of a concrete trench to separate the playing field from the stands. The trench is 9 ft. wide and about 9 ft. deep, and can be filled with water, if necessary, to keep spectators off the playing field.

The building was built with reinforcing rods and cement manufactured locally.

In their calculations, the builders gave each person in the general admission and standing room sections 85 centimeters of width. They believe this can be reduced considerably to squeeze in more than 150,000 spectators when necessary.

Architects are Antonio Dias Carneiro, Pedro P. B. Bastos, Orlando Azevedo and Rafael Galvao. Six local firms did the construction.

—Wide World photo

### Brazil's 5-year plan

In Brazil a construction budget totaling $655 million over the next five years has been set in motion by the recent formal approval of the so-called Salte Plan for the development of transport, power, agricultural and health facilities.

The plan hinges first on continued support by a new administration to be elected this year, and continued budgeting for a total federal expense of $515 million and secondly on the successful campaign to raise $250 million through bond issues and $100 million of Banco do Brasil loans.

The construction program includes much railroad and highway work, bridges, river work, canals and port completion of the Santos-Sao Paulo pipeline, runways and terminal facilities at six airports.

In the health budget there is $82,500,000 for hospitals, health centers and sanitary engineering work.

**Engineers needed** J. L. A. Wilson, chief engineer of Haifa, Israel, says that there is a great shortage of engineers in Israel. He says, "Aside from the graduates provided by the Haifa Technion, we have a great need for engineers, surveyors, draftsmen and other skilled technicians. American-trained engineers who are prepared to rough it under the austerity routine we now face temporarily will find interesting assignments and permanent jobs." Applications can be made to the American Technion Society, 154 Nassau St., New York City.

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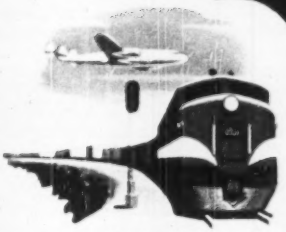

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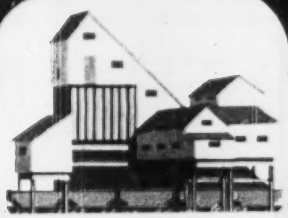
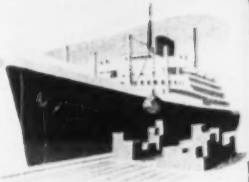


MINING

PETROLEUM

MANUFACTURING



MARINE

CONSTRUCTION

# Here today – *and still here tomorrow*

## THAT'S THE STORY OF ARKANSAS' CONCRETE STREETS

20th St., Little Rock, paved 1923.
Photos taken 1925 and 1949.

Arkansas public officials, motorists and taxpayers have reason to be proud of their old concrete streets. Many of them have served for 20, 30 or almost 40 years.

The surrounding pictures show three of these durable concrete streets. The cars, trees and people have changed, but the concrete pavements continue to serve long after they have paid for themselves.

The outstanding service that these old, durable concrete pavements have rendered in Arkansas is typical of concrete's performance in all sections of the country. Yet long service is only one of the many advantages of concrete pavements:

1. Concrete is safer—night or day, wet or dry—because its gritty surface has uniformly high skid resistance and its light color increases visibility at night.

2. Concrete usually costs less to build than other pavements of equal load-carrying capacity.

3. Concrete pavement costs far less to maintain.

4. Moderate first cost + small maintenance expense ÷ long service life = ***low annual cost***, the true measure of pavement economy.

For more information about this durable, economical pavement, write today for your free, illustrated copy of "*Concrete for Modern Streets*," distributed only in the United States and Canada.

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**Dept. 7c-17, 33 W. Grand Ave., Chicago 10, Illinois**

A national organization to improve and extend the uses of portland cement and concrete through scientific research and engineering field work

Jefferson St., Eldorado, paved in 1913.
Photos taken 1923 and 1949.

12th Ave., Pine Bluff, paved in 1921. Photos taken 1923 and 1949.

# MUNICIPAL AFFAIRS

## Bridge and harbor improvement will help build Memphis commerce

The latest big engineering project in Memphis, Tenn., is the Memphis and Arkansas Bridge, opened to traffic last December.

The new bridge, the third across the Mississippi River at Memphis, took nearly four and a half years to build and cost about $14,500,000. It is designed entirely for highway traffic with two 24-ft lanes separated by a 3-ft median strip. The approach from the Memphis side is a 2.0-mi bouleyard, thus greatly relieving traffic congestion.

Another big engineering project at Memphis is the work on the Tennessee Chute in the Mississippi River. The chute is being closed at the north end to protect the new $17,000,000 Port of Memphis Harbor. The excavated material is being used for an industrial embankment. A revetment on Presidents Island has been completed and 2050 ft of approach has been filled. The work is being done by the Corps of Engineers (ENR April 14, 1949, p. 70). Another major item in developing the harbor is 11 miles of rolled-fill levee on the city side of the river to protect a potential industrial area of 6,800 acres. The city has many diversified industries.

The population of Memphis is now upwards of 300,000, and the city is one of the country's chief centers of traffic by rail, water, highway and air. It is the largest inland cotton market and the greatest hardwood lumber market in the United States. It gets its hydro-electric power from the Tennessee Valley Authority and the White River in Arkansas. Its water supply comes from artesian wells.

### Traffic and Parking

**Vancouver, B. C.**—The Civic Parking Commission will investigate the suitability and cost of a 10-story civic parking garage now under construction in Des Moines, Iowa. A Vancouver project would be financed with revenue bonds, paid off from parking revenue. To date, Vancouver has two surface parking lots downtown, operated by the city-sponsored Downtown Parking Corporation, and three others either under construction or projected. Parking meters are in operation in the downtown business district.

**Cleveland, Ohio**—The City Planning Commission is considering a $6,500,000 program for construction of downtown parking garages and lots to accommodate 4,000 cars. The city would issue revenue bonds to build three five-level garages and an underground garage, as well as expand the lakefront parking lot, and provide for parking along the Inner Belt Freeway. The facilities would be expected to pay for themselves over a 20-year period. The three five-level garages would cost $2,000,000 for land and $2,000,000 for construction, and would each hold 700 cars. The downtown garage, for short-term parkers, would be a three-level structure underground in the Mall, to cost about $1,500,000. Another $1,000,000 would finance a great semi-circle of parking lots on the Inner Belt Freeway—all served by loop buses to the business center. City already has a municipal parking lot which will hold 2,000 vehicles.

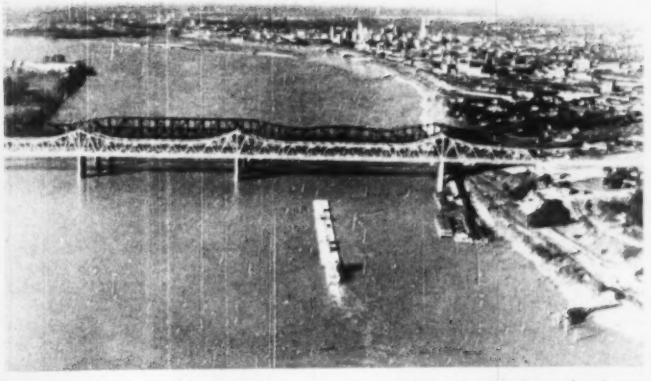
**Wilmington, Del.**—All-night curb parking for private automobiles is to be permitted on Wilmington streets, except in mid-city areas, but no vehicle may be parked continuously for more than 24 hours.

**Parking garages**—Allegheny County Planning Commission has suggested to the Pittsburgh, Pa., Parking Authority that two parking garages be constructed on downtown river fronts. They would extend for several city blocks, and, supported by columns over the Monongahela and Allegheny wharves, would park 3430 cars on floors and the roof. Cost is estimated at $3,500,000. Operation of the two garages together, it is claimed, would net $248,000 over the cost of paying off the 30-year bonds required to build them.

**Chicago, Ill.**—The city is taking steps to eliminate the parking of trucks and trailers in streets and alleys. One important step is the opening of a parking lot for 450 tractor trailers. The lot is on city property but will be operated privately. Fees are 50 cents a day. The lot is on the South Side, in an area reputed to have more truck traffic than any other comparable section of the city. This lot will meet only 40 percent of the area's truck parking needs. To escape fines, truckers unable to get into the lot will have to leave their vehicles in private parking areas. Ultimately the city hopes to have four truck terminals located in heavy traffic areas and inter-connected by special thoroughfares.

**Indianapolis, Ind.**—Several stores and theatres are among the stockholders in the newly organized Maryland Street Garage Corp., which is financing construction of a 7-floor parking facility for 575 cars at Illinois and Maryland Streets in the downtown area. The building will be of the pavilion type with open upper floor design, and provide parking on all seven levels, including the roof and basement. John G. C. Söhn is the architect, and A. V. Stackhouse Co. is the builder.

(Continued on page 58)



MEMPHIS FROM THE AIR—In the foreground is the new Memphis and Arkansas highway and pedestrian bridge. The other two are the Frisco and Harahan, both for the use of railroads exclusively. The Tennessee Chute is at the upper left.

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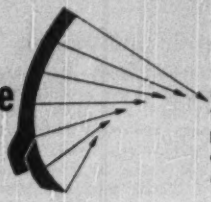

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| AD-4 | 104 | 22,140 lb. |
| AD-3 | 78 | 21,825 lb. |
| BD-3 | 78 | 19,042 lb. |
| BD-2 | 50.5 | 11,772 lb. |
| D | 34.7 | 8,500 lb. |

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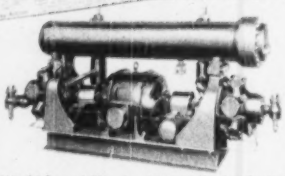

World-famed Chrysler Airtemp Sealed Radial Compressor. Ten of these Central System units and seven "Packaged" Air Conditioners cool the 6-story Times-Picayune Building.

Another distinguished name—that of the New Orleans *Times-Picayune*—has been added to the growing roster of modern buildings air conditioned by Chrysler Airtemp. When the decision was made to air condition this newspaper plant — Chrysler Airtemp was, naturally, the logical choice.

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Gentlemen: Please send me details about Chrysler Airtemp's engineering services for planning and installing air conditioning systems.

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## Municipal Briefs

**Houston housing**—Berne Construction Co., which is now building 270 homes on Market Street Road, Houston, Tex., is about to begin construction of an $8,000,000 residential development of 1,000 homes and a shopping center on a 230-acre site on Stella Link Road in the same city.

**Virginia schools**—The Virginia Department of Education says that within the next month $50,000,000 in state grants and $11,000,000 of Literary Fund loans will begin to be checked out to cities and counties for new school construction. Governor John S. Battle had favored a $39,000,000 school aid program, involving $45,000,000 in grants and $14,000,000 in Literary Fund loans.

**Baltimore building code**—Hoping to simplify and modernize building regulations, the city council building committee of Baltimore, Md., has begun hearings on an ordinance to adopt a new building code. A prime purpose is to make it possible for local builders to use the most recently developed materials and construction methods, especially for residential structures.

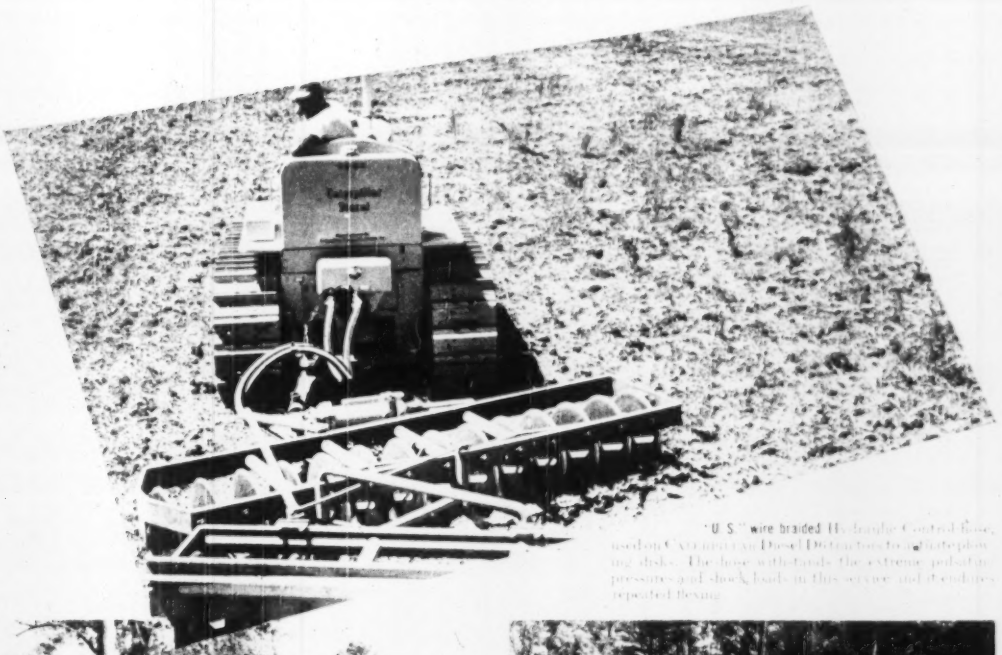
**E. St. Louis, Ill.**—A proposal to establish three downtown parking projects in East St. Louis is under study by a special committee of businessmen. The largest project is to be within 1,200 ft. of the business district and the other two are planned to be adjacent to the plaza for the new municipal bridge. The largest will accommodate 740 cars and each of the smaller will hold 300 automobiles. Cost of the projects is estimated at from $919,240 to $1,388,280, to be financed by a bond issue.

**Denver, Colo.**—Construction is about to start on the first off-street parking project in the "Mile high" city. It will be on Champa Street between 14th and 15th Streets. It will cost upwards of $400,000.

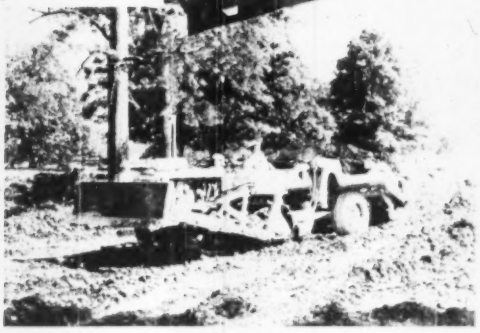
**Grade crossing elimination**—Five dangerous grade crossings over tracks of the N. Y. Central and B. & O. railroads in Rochester, N. Y., will be eliminated following the awarding of a $1,366,479 contract to the Bates and Rogers Construction Corp. of Chicago, by Bertram D. Tallamy, N. Y. state superintendent of the public works. York, Colvin and Hague streets will be closed to highway traffic and pedestrian underpasses constructed while the grades of Ames and Child streets will be depressed and vehicular underpasses constructed.

# VEINS FOR HIGH-PRESSURE HYDRAULIC SYSTEMS

## U. S. Rubber hose transmits power from "Caterpillar" Diesel Tractors to dam, road-building, and farm equipment



"U. S." wire braided Hydraulic Control hose, used on Caterpillar Diesel Tractors to operate ripping disks. The hose withstands the extreme pulsating pressures and shock loads in this service and it endures repeated flexing.



Building dams for farm ponds in soil erosion areas, the tractor shown is equipped with "U. S." Hydraulic Control hose. On such equipment as hydraulic lift bulldozers, shovel, plow or ripper blades, this hose proves its resistance to abrasion and the action of oils, greases and solvents.

Scraper building a timber access road uses "U. S." braided Hydraulic Control hose. Like another "U. S." product, air compressor service or braided rubber fire hose, this hydraulic hose is built into the hose. Outside the layer of high tensile braided steel wires.

When you work with any kind of hydraulically activated equipment, make sure you get full thrust and steady power by using United States Rubber Company's hose. And if you have an unusual problem, ask "U. S." technicians to work it out for you. Write to

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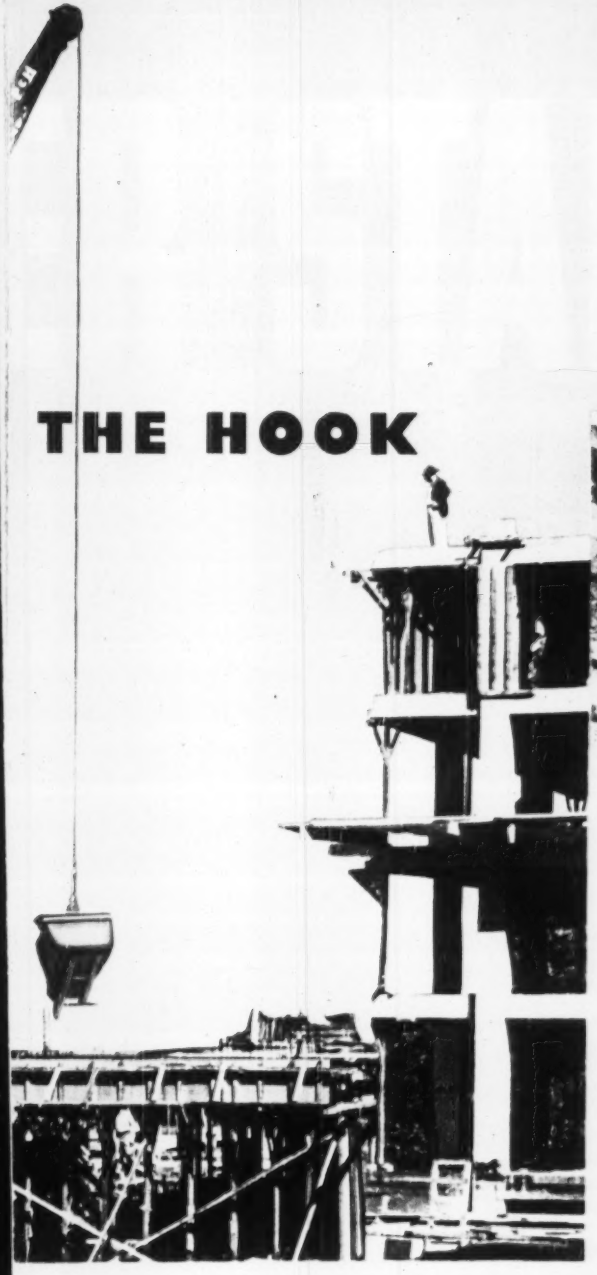
# THE HOOK



LOOK TO **P&H** FOR ADDED VALUES

## GIVES YOU MORE POWER AT THE TOOTH POINT

Stability is the major function of digging power, too. The same stability which gives P&H greater lifting capacity also gives you more tooth point digging power. Without useless deadweight, you have more power available . . . faster overall operation . . . lower production costs.

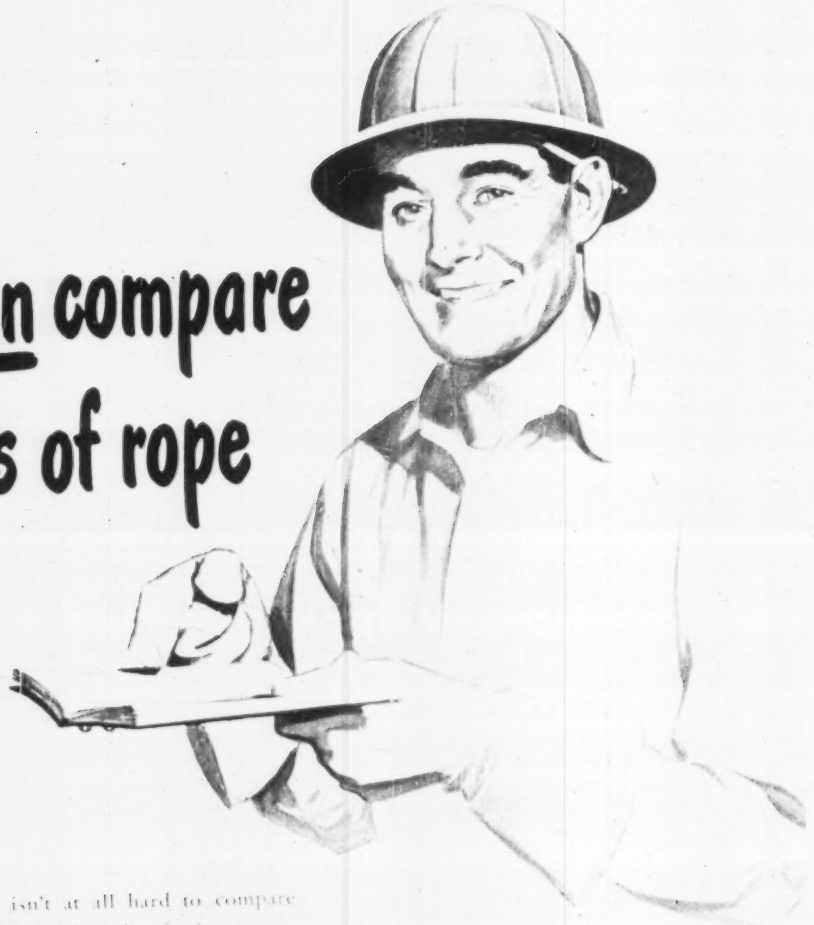
1. All welded construction of rolled alloy steels . . . originated by P&H . . . more highly developed by P&H.
2. True tractor type crawlers, most efficient traction on any excavator. You can make sharp or gradual or about face turns.
3. Low pressure hydraulic control is smoother . . . more responsive . . . easier on both operator and machine.
4. Rapid reversing planetary chain crowd gives you faster, more positive bite. Crowd chain outlasts 20 to 30 crowd cables.
5. Simpler design gives you an easier machine to work on . . . simplifies maintenance . . . reduces lay-up time . . . cuts costs.

*Only P&H gives you these Added Value features and at no extra cost.*

## ASK YOUR P&H DEALER

**P&H Excavators and Truck Cranes are more easily converted for the various types of service shown below — with hoist and digging drums on one shaft, the need for auxiliary shafts and gearing is eliminated. You also have a choice of gas, Diesel or electric power. Ask for literature on the size you need.**

# You can compare brands of rope



It isn't at all hard to compare different brands of wire rope—not if you keep a simple system of records.

These records should, of course, show the work totals done by your wire ropes during their lifetime. Pick as a basis the unit of work most applicable to your line of business—a ton-mile, for instance, in oil-country drilling; a cubic yard of rock moved; a car of coal hauled up a slope, etc. When the ropes have finally been retired from service, see how much—or how little—their cost has been per unit of work.

Bethlehem has always advocated the keeping of such records. One reason (we admit it freely) is that Bethlehem wire rope is an *economical* rope, and your records will prove it. We welcome comparisons with anybody's product.

BETHLEHEM WIRE ROPE

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LET YOUR RECORDS TELL YOU!

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In its London and Paris branches the M. W. Kellogg Company, largest designer and builder of oil refineries, keeps on hand intermediates of its home-office drawings and data sheets.

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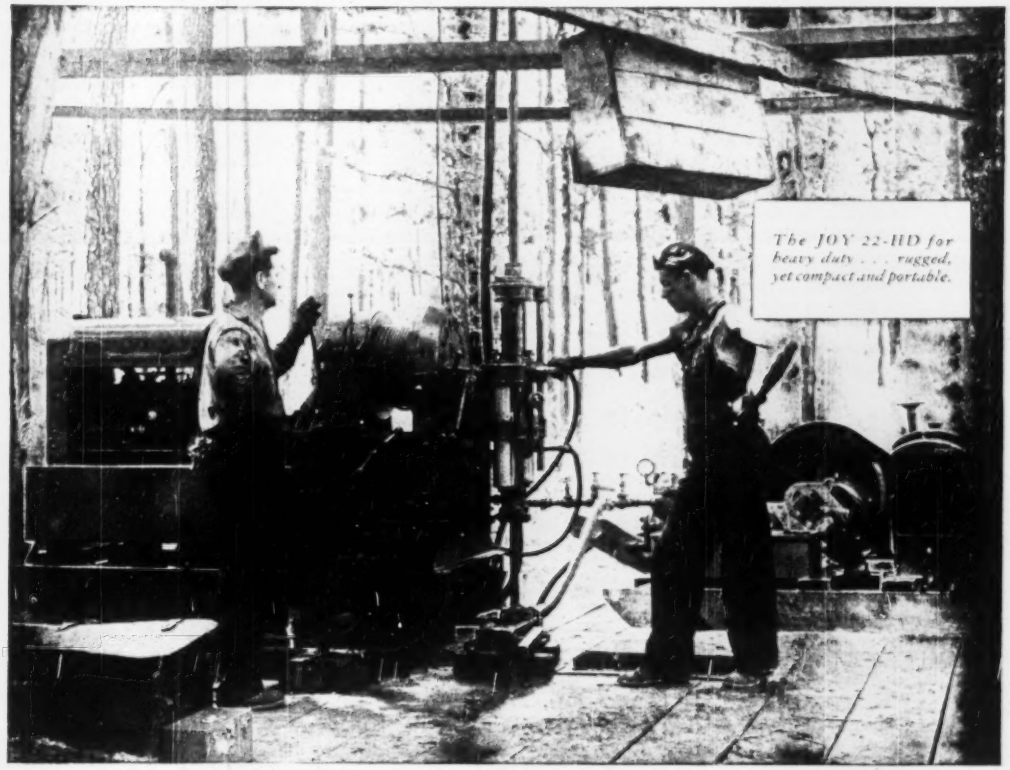
# MEN AND JOBS

George E. Bean, city manager of Pontiac, Mich., has been appointed city manager of Grand Rapids. He will succeed Frank H. Goebel. Mr. Bean who holds two engineering degrees from the University of Wisconsin, was a senior civil engineer in Milwaukee's engineer's office from 1927 to 1936. From 1936 to 1945, he was city manager of Escanaba, Mich., and in 1945 became city manager of Pontiac, Mich., where he developed a multi-million dollar improvement.

(Continued on page 66)

Natural gas is their business. O. W. Howard, left, is chief plant repairman at Tennessee Gas Transmission Co's Compressor Station Zero, near Hungerford, Tex. W. C. Dreinhoter, center, is station superintendent and Dan Taylor is engineer. Right now these men are completing a plant-capacity-doubling construction program with company forces.

Attending the recent opening of the Washburn Tunnel under the Houston Ship Channel at Pasadena, Tex., are right to left, Merrit-Chapman & Scott Corp. men: Carl H. Cotter, president; Ralph E. DeSimone, vice-president in charge of marine and heavy construction; Joseph R. Myers project manager at Pasadena; and William Moulton, job superintendent.



*The JOY 22-HD for heavy duty . . . rugged, yet compact and portable.*

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## JOY MANUFACTURING COMPANY

**GENERAL OFFICES: HENRY W. OLIVER BUILDING · PITTSBURGH 22, PA.**

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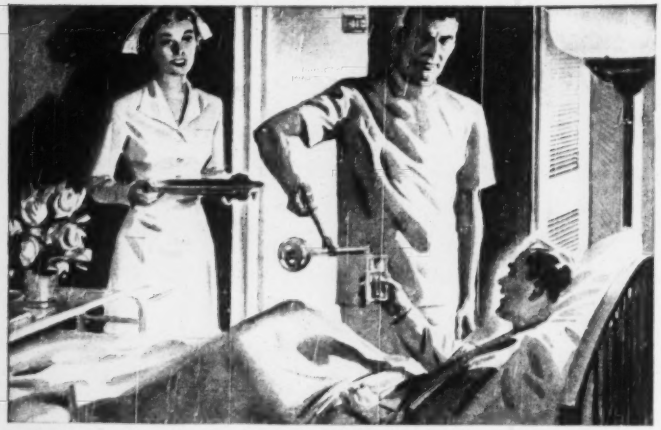
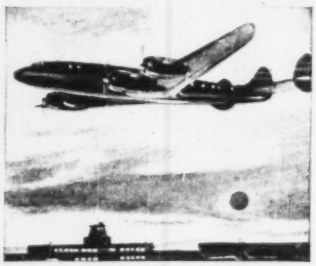
# Atom pile by-products "fly" to help medical research



**Radioisotopes** were needed by a Boston hospital for patient treatment. Lead-shielded box of radioactive iodine (weight, 35 lbs.) picked up by Air Express in Knoxville, Tenn., at 11 A.M.; delivered 7:15 P.M. Charge, $8.60. Hospitals, like all business, use Air Express regularly to get supplies from anywhere in hours.

**It's easier** and more convenient to use the *world's fastest* shipping service. When shipments are ready, just phone for pick-up. Special door-to-door service included in the low rates.



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**1150 cities** served direct by air, air-rail to 22,000 off-airline points.
**Experienced Air Express** has handled over 25 million shipments.

Because of these advantages, regular use of Air Express pays. It's your best air shipping buy. For fastest shipping action, phone Air Express Division, Railway Express Agency. Many low commodity rates in effect. Investigate.

AIR EXPRESS GETS THERE FIRST

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F. J. Quirin has been elected president of Frederick R. Harris, Inc., consulting engineers of 27 William St., New York City, with which company he has been associated for the last 11 years, successively as chief draftsman, design and production manager and vice-president in charge of engineering. Mr. Quirin took his C.E. degree at Brooklyn Polytechnic Institute in 1936. He served as chief engineer for H. E. Praeger, consulting engineer nine years.

---

**Col. Alan J. McCutchen** is the new district engineer of the Washington, D. C., district, Corps of Engineers. He succeeds **Col. Henry C. Wolfe,** who retired from the Army May 31 with the rank of major general. Wolfe is now with Mills & Petticord, architects, Washington, D. C.

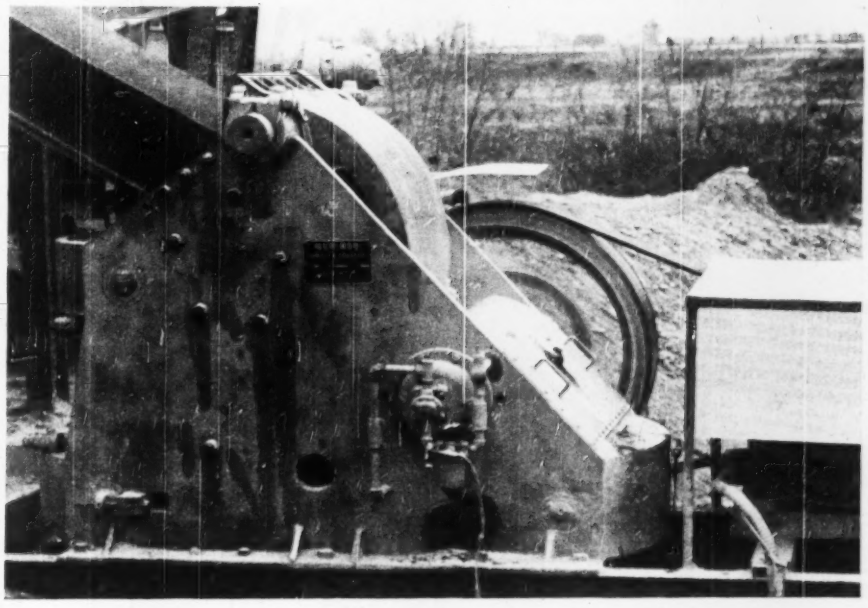
**Col. William H. Mills** has been appointed district engineer of the Walla Walla, Wash., district, Corps of Engineers, replacing **Col. William Whipple.** During the war Colonel Mills commanded the 46th Engineers, serving in the South Pacific, and later became operations officer for an engineer construction brigade in the Leyte operation. Whipple will attend the Industrial College of the Armed Forces before being assigned to another post.

**Charles W. Speight** has been appointed division maintenance engineer for the Tennessee State Highway Department with headquarters in Nashville, succeeding **Herbert M. Bates** who has been advanced to division engineer. Speight, first employed by the department in April, 1925, as a rodman, has a service record of 22 years, having filled the positions of instrumentman, district maintenance engineer, senior district maintenance engineer and division rural roads engineer.

**Thomas B. Corletti, Jr.,** engineer with the water department of Minneapolis, Minn., is to be city engineer of Columbia Heights, Minn. He is a civil engineer graduate of the University of Minnesota.

(Continued on page 69)

# Jaw Plates Cost Less Than...
# 1 CENT A TON



## Low Bidding Depends on Low Cost Crushing

**KUE-KEN 30" x 9" CRUSHER** shown is crushing hard river gravel and has run 18 months on the original jaw plates. They have not been turned once. When reversed should give an additional 18 months service. Jaw plates on previous crusher were completely worn out in three months' time.

**PLATES COST** less than 1c per ton as compared to 10c per ton for previous crusher on same job.

This Kue-Ken operates in closed circuit with a screen, 100% minus 1" and 100% minus 1", depending on requirements. Capacity of plant 300 tons per 8 hours to 1", about 50% through the crusher. In 18 months operation 90% of total production has been 100% minus 1". The previous crusher was unable to produce anything finer than 1½".

**ANOTHER OPERATOR** uses a 30" x 42" Kue-Ken Crusher rated at 50 tons per hour at 2" rock actually gets 80 to 125 tons per hour. The feed is extremely hard river boulders. In the same plant a 24" x 10" Kue-Ken produces 75 tons per hour at 3" rock. The catalog rating is only 54 tons per hour.

*Longer Jaw Plate Life and Bonus Capacity gives lowest cost crushing to Kue-Ken users.*

***Write today for Bulletin 605***

*Exclusive manufacturer for Eastern U. S. Canada and Puerto Rico:* Pennsylvania Crusher Co. Broad and Arch Sts., Philadelphia, Pa.

†Pronounced Que Ken. U. S. and Foreign Patents Pending.

572 CHESTNUT ST. • OAKLAND 20, CALIFORNIA

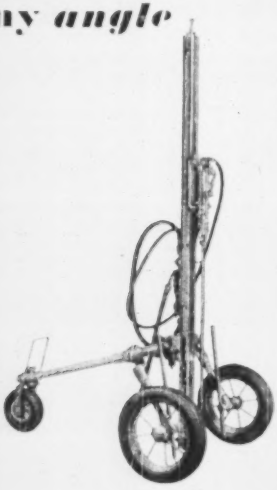
**STRAUB MFG. CO.**

| | | |
|---|---|---|
| Kue-Ken Balanced Crushers | Rib Cone Ball Mills | Overflow Classifiers |
| Kue-Ken Simplex Crushers | Concentrating Tables | Feeders |
| Kue-Ken Gyratory Crushers | Overhead Eccentric Crushers | Screenwheel Classifiers |

**for faster drilling**

**on any *location***

**at any *angle***



Providing fast and easy operation of the more powerful CP Drifter Drills (3½-inch and 4-inch cylinder bore), the medium-weight G-200H WAGON DRILL can be used anywhere — for drilling vertically, horizontally, or at any angle.

A sliding cone, with a 36-inch adjustment, offsets ground irregularities and uneven steel lengths. The flexible mounting makes it quickly adjustable for toe-hole drilling or bench drilling; its wheel-swivel for line drilling or drilling close to face. Its CP rotary air motor gives a steady feed and quick return, with plenty of power for pulling right steel.

The new G-150 — an outstanding combination of wagon drill and mounting — is designed for use with the new 50-pound Sinker or the 3-inch Drifter. Increases footage up to 100% over hand-held methods.

Write for SP-3010 describing the many outstanding features of this light-weight wagon drill.

**CHICAGO PNEUMATIC TOOL COMPANY**

General Offices: 8 East 44th Street, New York 17, N. Y.

PNEUMATIC TOOLS • AIR COMPRESSORS • ELECTRIC TOOLS • DIESEL ENGINES
ROCK DRILLS • HYDRAULIC TOOLS • VACUUM PUMPS • AVIATION ACCESSORIES

**R. F. Muckleston**, Brockville, Ont., has been appointed township engineer of South Gower, Ont.

**Clarence Decker**, Kalispell, Mont., city engineer, has resigned to become an engineer for S. Burch & Sons of Great Falls.

**Aime Cousineau**, civil engineer, director of Montreal's planning department, and **Jacques Greber**, French planning expert, consultant to the Canadian government and the city of Montreal, have been consulted with a view to their drafting plans for the rebuilding of Rimouski and Cabano, Que., recently destroyed by fire.

**Prof. Forest H. Green**, of the School of Civil Engineering and Engineering Mechanics at Purdue University, Lafayette, Ind., has been assigned by the U. S. State Department to aid Egypt in rebuilding its road system.

**Charles E. Hatch**, Toledo, Ohio, planning engineer, has been engaged as Defiance County sanitary engineer. County commissioners have voted to establish a sanitary district extending about a mile each way all around the city of Defiance.

**Col. Robert E. M. des Islets** has become engineer comptroller in the Office of the Army Chief of Engineers, Washington, D. C. He succeeds **Col. Hans W. Hohner**, who has been named district engineer of the Little Rock, Ark., District. Colonel des Islets has just completed three years of service in the Caribbean, first as Army engineer, later as Army comptroller at Headquarters, Quarry Heights, Canal Zone. He joined the Corps of Engineers in 1926 on his graduation from the U. S. Military Academy.

**Faisant and Kooken, Inc.** have changed their name to The L. P. Kooken Co., consulting engineers. Their address is 2017 Maryland Ave., Baltimore, 18, Md.

After more than two years duty in Japan and Korea, **Maj. Otto P. Kohler**, a steel design expert, has reported for duty at the office of the Chief of Army Field Forces, Fort Monroe, Va. Major Kohler was formerly a staff engineer and chief construction engineer of the Loftus Engineering Corp. of Pittsburgh, Pa., and vice-president and general manager of the Pittsburgh Machine and Steel Products Corp. His last overseas assignment was as chief of the special projects branch, Office of the Engineer, U. S. Army, Yokohama, Japan. At Fort Monroe he is

(Continued on page 70)

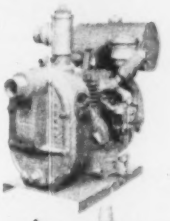

Marlow Pumps

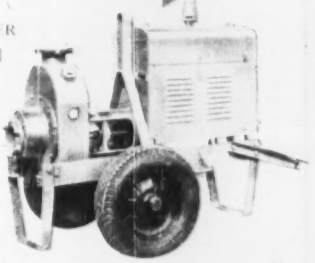
. . . sign of good pumping on construction jobs.

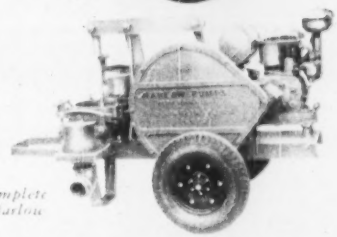
MARLOW MAKES THE WORLD'S MOST COMPLETE LINE OF CONSTRUCTION PUMPS

MARLOW MAKES BOTH TYPES . . . self-priming centrifugal and diaphragm . . . MARLOW MAKES THE LARGEST SIZE RANGE . . . 1½ to 10 inch, 3,000 to 240,000 GPH for the Water Wizard Self Priming Centrifugals. And for the Mud Hog Diaphragm Pumps — 3 and 4 inch single and 4 inch double, capacities to 9,000 gallons per hour. Steel wheel, rubber tire or flat-base mounted.

MARLOW OFFERS THE WIDEST POWER CHOICE . . . Gasoline or Diesel, air-cooled or water-cooled. Electric-driven. Belt driven. PLUS EXCLUSIVE MARLOW FEATURES . . . In the centrifugals, fast, automatic, trouble-free priming and repriming, by the exclusive diffuser method. In the diaphragm pumps: patented non-clogging valves. And other exclusive features.







Wherever pump users gather you will hear the name MARLOW used as a standard of pump efficiency, trouble-freedom and long life. It will pay you, too, to standardize on the standard.

*Write the Marlow factory for complete information and the name of the Marlow dealer nearest you.*

**MARLOW PUMPS** 510 GREENWOOD AVENUE RIDGEWOOD, NEW JERSEY

MANUFACTURERS OF QUALITY PUMPS SINCE 1924

International structural steel was used in the new Bernardin Bottle Cap Co. building, Evansville, Ind.

You'll Build Faster If You Build With *International Steel*

Here is the one place you can be sure of good delivery of structural steel — to fit your exact specifications. International's large stock of various steel shapes, standardized methods of manufacture, and a large, well-staffed plant make quick delivery possible.

You will find International Steel will cut your expenses by eliminating delays and by giving you exactly what you need. Write today for our prices.

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*It's Cheaper by delivering through the air with a*

# SAUERMAN
## TAUTLINE CABLEWAY

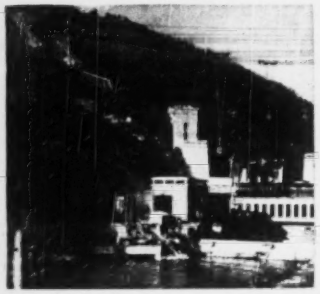

Illustration shows Sauerman Tautline Cableways working on Chastang Dam. Two identical machines with spans of 1610 ft. and conveying speeds of 1100 f.p.m. handle all the materials going into this dam. Mixed concrete is handled in 8 cu. yd. dump buckets, other materials in skips and slings.

Operating above the working area—never interfering with other operations, a Sauerman Tautline Cableway efficiently hoists, conveys, and places any material at any spot within its span, reaching out as far as 3,000 ft. if necessary. The machine may have stationary towers, mobile head and tail towers moving in unison, or one mobile tower operating radially around a stationary tower or anchorage.

Not all Sauerman Tautlines are as big as the two pictured at left. In contrast with these huge machines, which easily lift and carry 25-ton loads, are the general utility type machines with operating spans up to 500 ft. and lifting capacities up to 5 tons. One of these simple, semi-portable machines often handles all the materials in the construction of an ordinary bridge or similar structure, taking the place of derricks, cranes, concrete buggies, etc.

WRITE FOR TAUTLINE CATALOG 19-G

Rope Haulage Equipment Specialists Since 1909

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PNEUMATICALLY PLACED CONCRETE
RAPID - DURABLE - HIGH STRENGTH
for
Restoring Disintegrated Concrete
Dam, Dock and Bridge Repairs
Steel Encasement and Fireproofing
Sewer, Water Pipe and Penstock Linings
Stack and Bunker Linings
Wood Pile Casings—Pressure Grouting
Prestressed Tanks and Silos
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For KNOW-HOW • ENGINEERING • SUPERVISION • EQUIPMENT to keep jobs DRY

The Stang System has proved its efficiency and economy on both large and small jobs all over the United States. Stang engineering and supervision in planning, installation and operation insures a DRY JOB at all times.

JOHN W. STANG CORPORATION
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President Truman, left, and Frank A. Banks, district manager, Bureau of Reclamation at Coulee Dam, inspect the newly-unveiled plaque at the dam in honor of Franklin D. Roosevelt. Mr. Banks, who was engineer in charge of the construction of the dam and other features of the Columbia Basin project, received the Department of the Interior gold medal for his distinguished service in that connection.

ading in high echelon planning on manpower and equipment necessary to carry out Army engineering jobs."

F. W. W. Doane, of Halifax, N. S., now 87 years old, is still active in the practice of civil engineering as he has been steadily for the last 65 years. For 33 years he was chief engineer for Halifax. In the first world war he was a colonel in the Canadian Army, assigned to engineering and construction operations. He is now consulting engineer for the Standard Paving Maritime, Ltd.

(Continued on page 73)

Mark B. Owen, Indianapolis consulting engineer, cheerfully explains intricacies of incinerator-furnace design during an ENR-editor interview.

# KEEP YOUR HANDS

## *Out* of cement handling!

Handling bag cement is hard on the back and tough on the pocket-book. These 3 Erie Cement Plants take bulk cement mechanically from cement cars via undertrack screw and bucket elevator to the storage bin. Whatever your cement requirements there is Erie Cement equipment to meet your needs.

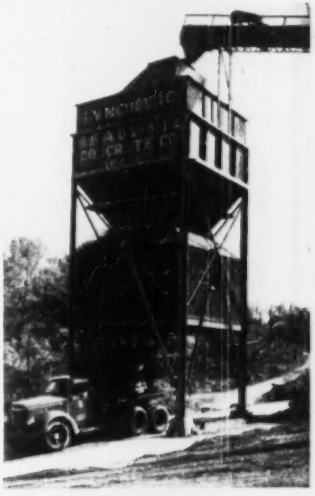
The Type "M" series at the left in 4 standard capacities will store from 172 to 600 bbls. in a portable-type plant.

The Type "L" series at the right in 3 capacities 575 to 1025 bbls. offers a knock-down or semi-portable plant for the large cement user.

The CSB Series the "silo type" offers two diameters (11 and 12 ft.) and 5 standard capacities in each to provide storage for 274 to 1014 barrels of cement.

Give Erie engineers the description of your cement needs and their recommendations will speed your cement batching, save enough over bag handling to pay for the plant and eliminate cement waste.

Erie Type "M" portable single compartment cement plant in 4 capacities (172 to 194 Bbls.) (270 to 304 Bbls.) (437 to 492 Bbls.) (525 to 600 Bbls.). Write for Booklet M-3.

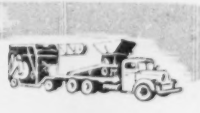


Erie Type "L" Single and Double Compartment Cement Bins standardized in 3 Capacities (575 to 645 Bbls.) (685 to 770 Bbls.) (910 to 1025 Bbls.). Write for Booklet L-2

Erie CSB 592 Bbls. (11 ft. dia.) "Silo" Cement Bin shown. Available in 11 and 12 ft. diameters in 5 sizes each—also widely used for added recirculation ground storage in any capacity desired. Write for data.

**ERIE**

STEEL CONSTRUCTION COMPANY

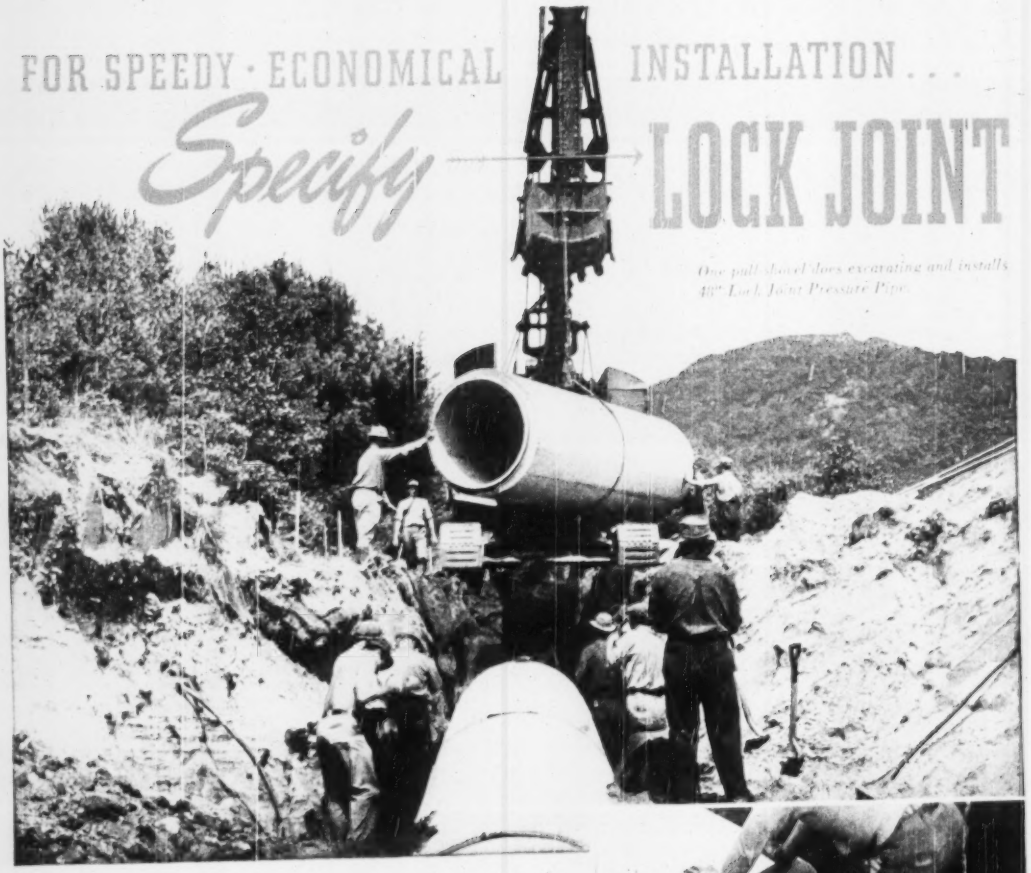


**107 GEIST ROAD • ERIE, PENNSYLVANIA**

# FOR SPEEDY · ECONOMICAL INSTALLATION . . .

# *Specify* → LOCK JOINT

*One pull shovel does excavating and installs 48" Lock Joint Pressure Pipe.*



*Rubber and Steel Joint ready to be pushed home.*

With its exclusive Rubber and Steel Joint, Lock Joint Reinforced Concrete Pressure Pipe is installed rapidly and efficiently in extremes of heat or cold—in wet ditch or dry.

Only one machine is required to make the excavation and install the pipe. No caulking or bolting of the joint is necessary, and the pipe may be back-filled immediately. The Rubber and Steel self-centering expansion joint is flexible to accommodate ground settlement, and is watertight at any internal pressures common to American Water Works practice.

Today, millions of feet of Lock Joint Reinforced Concrete Pressure Pipe, equipped with the Rubber and Steel Joint, installed at low cost and needing little or no maintenance, are giving unfailing service throughout the Western hemisphere.

**LOCK JOINT PIPE COMPANY**

*Est. 1905*

P.O. Box 269, East Orange, N. J.

PRESSURE PIPE PLANTS: Wharton, N. J. • Tampa, Fla. • Detroit, Mich.

BRANCH OFFICES: Cheyenne, Wyo. • Denver, Colo. • Kansas City, Mo. • Valley Park, Mo. • Chicago, Ill. • Rock Island, Ill. Wichita, Kan. • Kenilworth, N. J. • Hartford, Conn.

*SCOPE OF SERVICES: Lock Joint Pipe Company specializes in the manufacture and installation of Reinforced Concrete Pressure Pipe for Water Supply and Distribution Mains in a wide range of diameters as well as Concrete Pipe of all types for Sanitary Sewers, Storm Drains, Culverts and Subaqueous Lines.*

**LOCK JOINT**
*Reinforced Concrete*
**PRESSURE PIPE**

James F. Salmon, New York Manager of the Arundel Corp., is this year's president of The Moles, association of New York heavy-construction men. He succeeded Carlton S. Proctor, of Moran, Proctor, Freeman and Mueser.

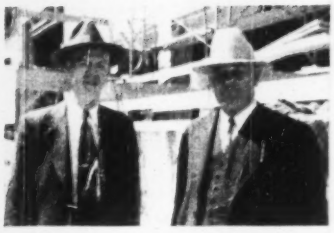
---

Robt. F. Werner has provisional appointment as city engineer of Columbus, Ohio, succeeding Paul W. Maetzel, resigned.

John Wiseman, Anchia, Ohio, a sanitary engineer with the federal government for nine years, has resigned to go with the U. S. Public Health Service, and has been assigned as assistant engineer of the Ohio and Tennessee basins.

Marion Reese Cochran of Newton, N. C., who has just received a B.S. degree in civil engineering from North Carolina State College, has been named an engineer with the public works department at High Point, N. C.

C. C. Reynolds, who retired as New Castle County, Delaware, division engineer of the Delaware Highway Department, has been appointed engineer for Newark, Delaware.



H. E. Ulrich, left, and Alfred C. Finn pause for a moment during a conference about stonesetting on Sakowitz department store, in Houston, Tex. Ulrich is vice-president of Tellepsen Construction Co., the builder. Finn is the architect.

*Happy Choice* for easy handling, faster drilling, lower costs
**Le Roi CLEVELAND SINKERS**

YOU bet a driller's happy when he gets his hands on a Le Roi CLEVELAND Sinker at the start of a shift. He knows that these easy-holding, fast-drilling tools let him do a man-size job — and he'll be less tired at the end of the shift.

You'll be even happier. Because you get extra footage per drill per shift when you use Le Roi CLEVELAND H10 (45-lb.) and H11 (55-lb.) sinkers. Take a healthy crack at drilling costs on your jobs. See your Le Roi distributor. Also write us for latest catalogs.

**— for dependable low-cost air-power use Le Roi Compressors.**

**Experienced distributors everywhere to give prompt service on the job!**

Airmaster

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RD-25

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CLEVELAND DIVISION • *Manufacturers of* CLEVELAND ROCK DRILLS
CLEVELAND 11, OHIO • New York • Washington • Birmingham
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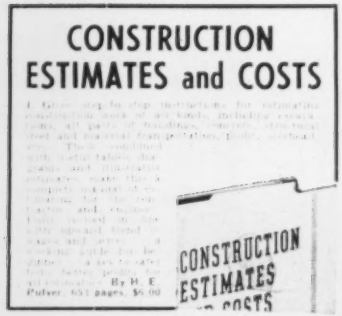
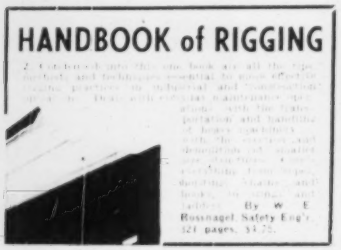
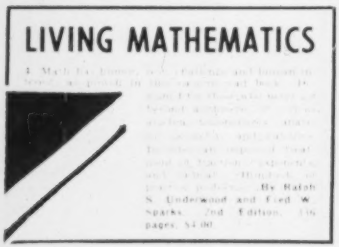


THE BUSINESS OF HOME BUILDING
By H. R. Johnstone. "Carnegie Institute of Technology, and C. E. Joern. Wm. Joern and Sons. 289 pages. $3.50 $4.00
THE BUSINESS OF

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# EDUCATION and RESEARCH

ARCHITECT'S SKETCH shows $2,000,000 Engineering Unit No. 1 on Los Angeles campus of University of California. Wing at left is currently under construction; wing at right is complete. More than $16,000,000 in construction projects have been completed or are under way on this campus as part of UC's $120,000,000 postwar building program. Frank N. Ropp is structural engineer; Allison & Rible, architect.

## Minnesota to dedicate 3 engineering buildings

The University of Minnesota Institute of Technology will celebrate the university's 1950-51 centennial with a three-day program next Oct. 5-7. It will be highlighted by the dedication of three new engineering buildings on the campus in Minneapolis. All institute buildings will be open to the public, and tours will be conducted to various facilities, including the St. Anthony Falls Hydraulics Laboratory and the Rosemount Research Center.

An outdoor dedication of the university's new aeronautical, mechanical and chemical engineering buildings will be held during the first day of the celebration.

During the alumni dinner in Coffman Memorial Union, University President J. L. Morrill will present outstanding achievement medals to Institute of Technology alumni who have to their credit significant accomplishments in their respective professional fields. Presiding at the dinner will be Dean Athelstan F. Spilhaus of the institute.

Each department of the institute on Oct. 6 will report on its research during technical sessions to be followed by a luncheon attended by various professional groups in the field of engineering.

Alfred E. Cronk, assistant professor of aeronautical engineering, is chairman of the institute's centennial program.

## Good concrete material found in volcanic ash

A report from the engineering department of Oregon State College on the results of a research study into the pozzuolanic properties of Oregon volcanic ash has shown that ash samples examined may be considered a source of pozzuolanic material suitable for use in massive concrete structures. Pozzuolana is a loosely compacted siliceous rock of volcanic origin.

The study, made at the request of the Oregon Raw Materials Survey, indicates that unprocessed volcanic ash found in the Bend, Ore., area can replace nearly 30% of the cement used in large concrete structures with no loss in strength.

The Raw Materials Survey notes the importance of this study to the Pacific Northwest in view of the large quantities of pozzuolanic materials now being imported from the Midwest for use in dam construction. It cites that fly ash from coal burning power plants in the Chicago area is being used in construction of Hungry Horse Dam on the Flathead River's South Fork in western Montana.

---

Ray K. Linsley, Jr. has been appointed associate professor of hydraulic engineering at Stanford University, Calif., replacing Leon B. Reynolds, retiring. Linsley, has been head of the hydrologic branch of the U. S. Weather Bureau for the last five years.

## ELECTIONS AND ACTIVITIES

The Cumberland Falls section of the Society of Professional Engineers has been organized at Somerset, Ky. Alex Bays, a mining engineer, has been elected president. Other officers are: H. H. Sandusky, highway engineer, vice president, and V. D. Roberts, secretary-treasurer.

Arthur C. Bullen, Jr., of Del Rosa, Calif., has been appointed executive secretary of the California Society of Professional Engineers.

Charles B. Wilcox, Pittsburgh, has been elected president of the Pennsylvania Motor Truck Association, succeeding William L. Clements, of Warren, Pa. Other officers are: Edward Cogelin, Harrisburg, first vice president and general manager; Floyd B. Norris, Uniontown, second vice president; Thomas Palmer, Moscow, third vice president; Fred K. Geiger, Philadelphia, fourth vice president; Harry L. Gumbes, New Castle, treasurer; and J. R. Cox, Pittsburgh, secretary.

## MAJOR MEETINGS

**Photogrammetry Seminar**, University of Denver, Denver, Colo., Aug. 14-18.

**Maine Water Utilities Association**, Summer meeting, Mt. Desert Island, Me., Aug. 9.

**ASCE**, North Carolina section joint meeting with N. C. Society of Engineers, Wrightsville Beach, N. C., Aug. 18-19.

**Pennsylvania Water Works Operators' Association**, Annual conference, State College, Pa., Aug. 21-22.

**Pennsylvania Sewage & Industrial Wastes Association**, Annual meeting, State College, Pa., Aug. 23.

**N. Y. section AWWA**, Fall meeting, Saratoga Springs, Lake George, N. Y., Sept. 7-8.

**W. Va. section AWWA**, Annual meeting, Greenbrier Hotel, White Sulphur Springs, W. Va., Sept. 11-13.

**American Railway Bridge and Building Association**, Annual meeting, Hotel Sherman, Chicago, Ill., Sept. 18-21.

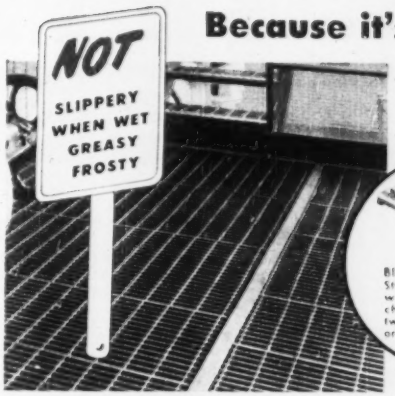
**New England Water Works Association**, Annual meeting, Mt. Mansfield, Vt., Sept. 18-21.

**N. Y. Metropolitan section Institute of Traffic Engineers**, Annual meeting, Commodore Hotel, N. Y. City, Sept. 24-27.

**American Institute of Park Executives**, Annual meeting, Hotel Penn-Harrison, Penn Sta., Sept. 25-28.

**Pennsylvania Water Works Association**, Chalfonte-Haddon Hall Hotel, Atlantic City, N. J., Sept. 26-28.

**Rocky Mountain Sewage Works Association**, La Fonda Hotel, Santa Fe, N. M., Sept. 26-28.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**"TWISTED BAR"**
**Electroforged**
**Steel Grating**

Blaw-Knox Electroforged Stair Treads available with rolled diamond checker plate nosing, twisted crossbar nosing or abrasive nosing.

THE twist does the trick—twisted bar construction gives greater traction, makes slipping impossible even if the grating is wet, greasy or icy. The slightly roughened surface grips shoe soles for *extra* safety, yet the over-all surface is level. Trucks and other wheeled vehicles roll freely. In addition, Blaw-Knox Steel Grating is electroforged into one piece for extra strength and durability.

**OTHER ADVANTAGES:** Maximum open area for light and air. Self-cleaning, easy to maintain, economical to install.

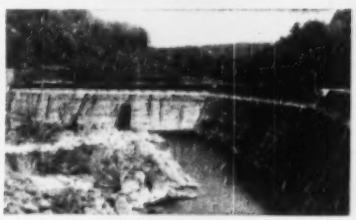
**GET THE FACTS FROM BULLETIN 2296**

Big new bulletin gives complete details, specifications, possible applications and all the outstanding advantages of Electroforged Steel Grating and Stair Treads. Write for your copy today!

**BLAW-KNOX DIVISION of Blaw-Knox Company**
**2001 Farmers Bank Bldg., Pittsburgh 22, Pa.**

**BLAW-KNOX ELECTROFORGED STEEL GRATING**

**DAM SAVED WITH "GUNITE" BY CEMENT GUN COMPANY**

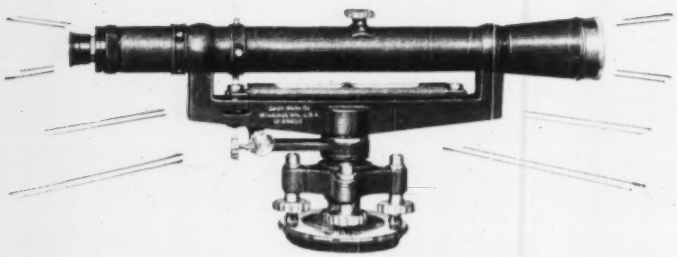


In 1944, we were called upon to make "GUNITE" repairs on the Connecticut Light and Power Corporation's Tunnel Dam. Its poor condition, at that time, is shown in the upper right picture.

After chipping away all loose and unsound masonry, we installed a system of drainage channels and weep pipes and completely reintegrated the down-stream face with reinforced "GUNITE". The photo at left shows the actual application of "GUNITE" over welded reinforcing mesh.

Other dams we have saved by this method are pictured in Bulletin A2400 together with a wide variety of other "GUNITE" applications. Write today, on your letterhead, for a copy.

**CEMENT GUN COMPANY**
**"GUNITE" CONTRACTORS**
GENERAL OFFICES—ALLENTOWN, PENNA. U.S.A.
MANUFACTURERS OF THE CEMENT GUN



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| *Features* | D. White No. 7080 | Instrument A | Instrument B |
|---|---|---|---|
| Magnifying Power of Telescope | 35X | 30X | 27X |
| Distance away you can read 1/100 ft. graduation | 1200 ft. | 1050 ft. | 900 ft. |
| Diameter of objective lens | 1.81 in. | 1.485 in. | 1.69 in. |
| Field of view (in minutes of arc) | 64' | 52' | 60' |
| Coated optics | YES | YES | YES |
| Covered Leveling Screws | YES | YES | YES |
| Can you easily replace worn leveling screws in the field? | YES | NO | YES |
| Sensitivity of level vial (in seconds of arc per 2mm of graduations) | 20" | 20" | 25" |
| Price — Complete with carrying case, tripod and accessories — F.O.B. factory | $245.00 | higher | higher |

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## OBITUARY

**John M. Cashman**, 69, associated as civil engineer with Weston & Sampson, Boston consultants, for 47 years, died suddenly at Watertown, Mass., on July 2. He was a native of Stafford Springs, Conn.

**Frank O. Laing**, 65, who was engineer of Polk county, Iowa, with headquarters at Des Moines from 1919 to 1948, died recently at his home in Long Beach, Calif.

**Glenn H. Martz**, 60, died recently in St. Bonifacius, Minn. He had been with the Minnesota highway department for 17 years and was maintenance engineer of its District 9 when he passed away.

**Albert Leighton**, 62, president of the Aldon Construction Co., Los Angeles, died June 21 of a heart attack. The company he headed was one of the largest builders of apartments and homes in Los Angeles. Mr. Leighton was born in London, England.

**Roy Lee Gorrell**, retired highway contractor and former president of the Kentucky Highway Contractors Association, died recently in Russellville, Ky.

**William H. Reeves**, 54, retired from Florida's State Road Department, died July 1 at Daytona Beach. He had been with the highway department for 25 years.

**Rene Ravenel**, 62, died recently at Charleston, S. C. He was a highway engineer and an authority on rights-of-way and land titles in his locality. At the time of death, he was employed by the Charleston County Council.

**John Neal Philbrook**, 62, who had been associated with the Raymond Concrete Pile Co. since 1911, died July 5 at Tenafly, N. J. He was a 1910 graduate of the University of Maine and a native of Portland, Maine.

**Sterry J. Mahaffey**, 46, engineer-director of the Virginia Road Builders' Association for the past four years, died suddenly in Baltimore, July 1. He was attending a meeting of the Board of Directors of the Contractors' Division of the America Road Builders' Association at the time. He received his engineering training at both Pennsylvania State College and the University of Richmond and was president of the Virginia section of the American Society of Civil Engineers.

# UNIT PRICES BID BY CONTRACTORS

## Steel, concrete bridges for New Jersey Turnpike

Bids taken April 18 on the superstructure over the Raritan River brought in a low of $8,848,170 and on 17 steel and concrete structures between Allentown and Prospect Plains a low of $1,365,108 for the New Jersey Turnpike Authority. Charles M. Noble, chief engineer. Howard, Needles, Tammen & Bergendoff are general consultants; De Leuw, Cather & Company are consulting engineers.

The jobs are in Mercer and Middlesex Counties, near a branch line of the Pennsylvania Railroad. The contractors must supply all labor and materials and maintain traffic during the construction. Liquidated damages will amount to 0.04% of the total price bid per day on contracts over $100,000 with a minimum penalty of $40 per day.

Concrete with air entainment must have the following proportions: Class B, 1 cement:1.44 sand:3.36 coarse aggregate—1,512 void content; Class C, 1 C:1.92 S:3.84 A—1.728 VC; Class D, 1 C:2.16 S:4.32 A—1.944 VC.

Wage rates prevailing are: iron workers, structural and reinforcing, $3.10 per hour plus 3% welfare fund; cement finishers, Middlesex Co. $2.90, Mercer Co. $2.75; carpenters, $2.50; hoisting engineers, $2.25; common laborers, $1.75.

### Contract 21, Section 4

This work includes the 17 structures, drains, pipe conduits for utilities crossing the Turnpike and handrails, between Allentown and Prospect Plains. It must be completed on or before June 1, 1951.

The low bid on the 17 structures was 3% below the second low and 35.9% below the 12th and high bid.

Bidders were:

1 P. T. Cox Constr. Co., Inc., New York, N. Y. (Contr.) ..... $1,365,108
2 John Rosenblum, Inc., N. Y., N. Y. ..... 1,407,308
12 Ole Hansen & Son, Inc., Pleasantville, N. J. ..... 2,129,356

| Items | Quantity | | Unit Prices | |
|---|---|---|---|---|
| | | | M. | $ |
| Borrow fill | cy | 2,500 | $5.00 | $1.50 |
| Excav. open fdn. | cy | 10,100 | 5.00 | 5.00 |
| Sand backfill, fdn. | cy | 350 | 6.00 | 4.00 |
| C I B concr. | cy | 1,200 | 50.00 | 50.00 |
| C I B concr. | cy | 1,500 | 50.00 | 50.00 |
| C I D concr. | cy | 1,000 | 40.00 | 42.00 |
| C I D concr. | cy | 1,050 | 35.00 | 35.00 |
| Reinf. steel | lb | 1,400,000 | 0.12 | 0.11 |
| Struct. steel | lb | 3,600,000 | 0.10½ | 0.11 |
| Beam piles: | | | | |
| Bid one type only | | | | |
| a 8 H concr. | lf | 12,000 | | |
| b 10 H concr. | lf | 11,500 | | |
| c 12 H timb. | lf | 13,500 | 2.00 | 1.80 |
| Bid one type only | | | | |
| a 8 H concr. | lf | 21,600 | 6.00 | 6.10 |
| b 10 H concr. | lf | 20,100 | | |
| c 12 H concr. | lf | 19,500 | | |
| Riprap slope prot. | sy | 2,900 | 6.00 | 8.00 |
| Binding | lf | 6,500 | 6.00 | 6.00 |
| a C I pipe drain | lf | 260 | 6.00 | 5.70 |
| 8" C I pipe drain | lf | 1,000 | 4.00 | 4.10 |
| 8" C M pipe drain | lf | 1,500 | 3.00 | 3.00 |
| 4" conc. cond. | lf | 13,900 | 1.30 | 1.90 |
| 4" st cond. | lf | 2,500 | 2.50 | 3.30 |
| For bridge decks, walks, curbs, parapets, railings & other thin sections above piers | | | | |
| For piers, shafts & abutments & their adjoining wingwalls | | | | |

### Contract 30, Section 5

The superstructure is for a 5-span, 500 foot deck plate girder bridge across the Raritan River, near New Brunswick and must be completed June 15, 1951. The three bids were 7.5% apart.

1 Harris Structural Steel Co., Inc., New York, N. Y. (Contr.) ..... $8,848,170
2 American Bridge Co., New York, N. Y. ..... 9,041,102
3 Bethlehem Steel Co., Bethlehem, Pa. ..... 9,514,427

| Items | Quantity | | Unit Prices | |
|---|---|---|---|---|
| | | | M. | $ |
| Struct. steel | lb | 4,100,000 | $1.65 | $0.1701 |
| Concr. C I B | cy | 1,320 | 20.00 | 21.00 |
| Reinf. steel | lb | 310,000 | 0.14 | 0.162 |
| 36 bridge grate | sf | 2,030 | 3.00 | 3.85 |
| 36 pipe hdrail | lf | 1,530 | 6.00 | 6.20 |
| Erect work | lb | | 5,000 | 5.75 |
| Final clean up | ls | | 3,000 | 600.00 |

## Intake tunnel extension at Niagara Falls, N. Y.

Eight bids, May 17, on the Niagara Falls intake structure and tunnel ranged between $756,727.50 and $1,225,575, all above the engineer's estimate. The low bid was 2.8% below second low and 38.3% below high.

The tunnel is an extension of the existing intake tunnel from about 1500 feet off shore to a point in the Canadian Channel of the Niagara River, south of Grand Island.

The specifications call for three classes of concrete. Class B, formed, and Class C, unformed, are general structural concrete with 6 gallons of water per sack of cement. Class D is mass concrete for foundations, 8 gallons of water per sack of cement. All materials are furnished by the contractor.

The concrete quantities listed below do not include the tunnel lining, which is included in the unit price for the tunnel itself.

Wages to be paid are: common laborers, $1.77 per hour; ironworkers, $2.52½; semi-skilled, $2.02; cement finishers, $2.47½.

1 Lee Butler Co., College Park, Md. (Contr.) ..... $732,000
2 Bates & Rogers Constr. Corp., Chicago, Ill. ..... 777,795
8 A. S. Wickstrom, Inc., Skaneateles, N. Y. ..... 1,225,575

| Items | Quantity | | Unit Prices | |
|---|---|---|---|---|
| | | | M. | $ |
| Intake tunnel, std. | lf | 1,255 | $554.70 | $696.00 |
| Intake tunnel, reinf. | lf | 50 | 172.00 | 200.00 |
| Junction | ls | | 7,500 | 7,000 |
| Intake shaft | lf | 35 | 350.00 | 510.00 |
| Intake structure | ls | | 135,160 | 60,400 |
| Drilling pr holes | lf | 500 | 8.00 | 1.20 |
| Drain pipe | lf | 3,375 | 4.10 | 6.00 |
| Excav. earth | cy | 350 | 12.50 | 5.50 |
| Excav. rock | cy | 100 | 33.00 | 10.00 |
| Concrete C I B | cy | 50 | 52.00 | 65.00 |
| C I C | cy | 40 | 45.00 | 65.00 |
| C I D | cy | 350 | 36.00 | 42.00 |
| Grout | cy | 200 | 20.00 | 65.00 |
| Steel, reinf. | lb | 10,000 | 0.15 | 0.12 |


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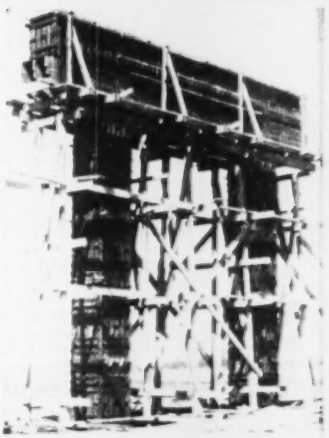

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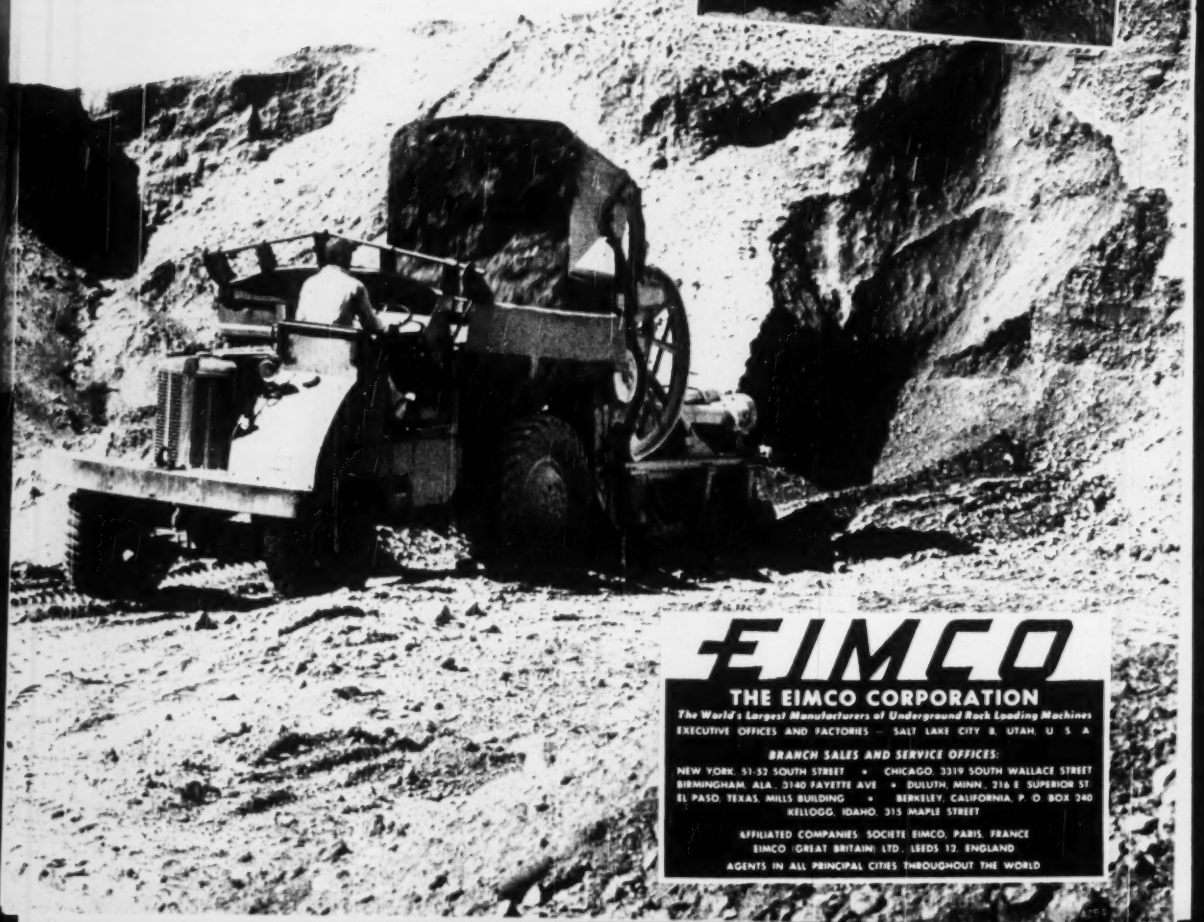

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# CONSTRUCTION REPORTS

## Bids Asked—Low Bidders—Contracts Awarded

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 18, N. Y.
ELSIE EAVES, Manager  J. A. MAHONEY, Reports  M. R. ROESSLER, Statistics

## WATER SUPPLY

BIDS ASKED

Del., New Hamburg ...

Va., Montross ...

Fla., Jacksonville (P.A.) ...

Fla., Lake City ...

Tex., Abilene (P.A.) ...

▲ Wash., Vancouver ...

Ga., Douglasville (P.A.) ...

LOW BIDDERS

Calif., Oakland ...

$110,407

Kan., Topeka ... $733,000

CONTRACTS AWARDED

+ D. C., Wash. ... $545,315

Kan., Topeka ... $733,000

+ N. M., Los Alamos ... $714,058

N. C., High Point ... $66,300

Okla., Ardmore ... $537,061

Tex., Houston ... $12,600

Ont., Hamilton ... $56,844

## SEWERS, WASTE DISPOSAL

BIDS ASKED

Calif., Oakland (P.A.) ...

Kan., Olathe (P.A.) ...

Okla., Anadarko (P.A.) ...

Tex., Johnson City (P.A.) ...

Tex., Moulton (P.A.) ...

LOW BIDDERS

Md., Hyattsville (Washington Suburban Sanitary Comm.) ...

Pa., Phila. ... $424,450

CONTRACTS AWARDED

Calif., Eureka ... $700,000

N. J., Camden ... $573,345

Pa., Ambler ... $560,961

Tex., Houston ... $69,000

Tex., Houston ... $100,000

## BRIDGES

BIDS ASKED

O., Columbus (P.A.) ...

+ Nebraska (P.A.) ...

LOW BIDDERS

Missouri, Highway ... $108,336 ... $94,800

### PROJECTS COVERED

#### Projects—By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $20,000; other public work, $50,000; industrial buildings $66,000; other buildings $250,000.

#### Classes of Construction

(Name in order of listing)

| | |
|---|---|
| Water Supply | Latin America |
| Sewers, Waste Disposal | Public Buildings |
| Bridges | Commercial Buildings |
| Streets & Roads | Industrial Buildings |
| Earthwork, Waterways | Unclassified |

#### Stages Reported

PROPOSED WORK: Including appointment of engineers or architects.

BIDS ASKED: New announcements only. For full calendar, see also preceding issues of ENR.

LOW BIDDERS: On jobs of a $100,000 value or low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case a supplementary contract award report will be published.

CONTRACTS AWARDED: Except awards to low bidders previously reported in low bidder stage.

Dates shown are of issue in which last previous report was published.

#### Symbols and Abbreviations Include:

| | |
|---|---|
| + | Federal Government |
| ▲ | Project of $1,000,000 or over. |
| B.A. | Bids Asked |
| ENR | Engineering News-Record |
| CD | Engineering News-Record Construction Daily |

## STREETS AND ROADS

BIDS ASKED

D., Dayton (P.A.) ...

O., Toledo (P.A.) ...

Wis., Pewaukee (P.A.) ...

Del., Wilmington (P.A.) ...

+ Missouri (P.A.) ...

North Carolina and Virginia (P.A.) ...

+ Idaho, Ariz. ...

LOW BIDDERS

Calif., San Francisco ... $114,130

+ Idaho ... $437,112

▲ Wisconsin ... $56,117 ... $133,403 ... $126,776 ...

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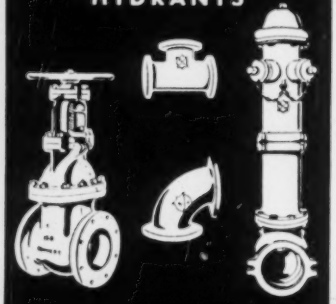

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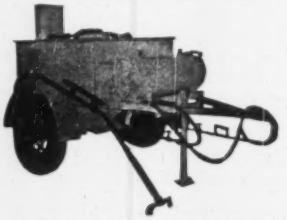

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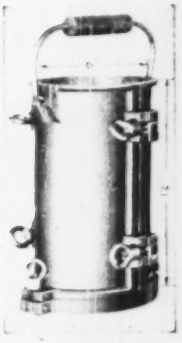

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LOW BIDDERS

▲† California — Bureau Reclamation, Dist. Engineer, Shasta, July 6, Cachuma Dam on Santa Ynez River, Santa Barbara Co. Spec. 3964, from Mittry Supply Co., 4801 San Fernando Rd., West Los Angeles, $6,717,660. CD 6/7.

Calif., Palmdale — Palmdale Irrigation Dist., Palmdale, June 28, furnishing 29,545 ft. 6- to 12- in. 18-24 Buble and wrapped welded steel pipe from Southern Pipe & Casing Co., Box G, Azusa, $34,024.

† Indiana — U. S. Eng., R. O. box 59, Louisville, Ky., Ohio Pumping Plant gates at points of Deer Creek and Wabash River, Delphi, from Paul B. Jeffery, Inc., Navarre Ave., Toledo, O., $102,083. CD 5/29.

† Washington — Bureau Reclamation Dist. Interior Eng., June 26, earthwork, asphaltic membrane lining, pipe lines and structures for lateral E-23 and sub-laterals, Columbia Basin Proj., Spec. 599, from A. A. Tertling & Sons, Inc., 3001 Fairview Ave., Boise, Idaho, $512,248. Est. $469,881. CD 6/19.

N. S., Brooklyn — Dist. P. Wks., Hunter Bldg., Ottawa, June 28, breakwater repairs, moles, from J. P. Porter, Ltd., 43 Catherine St., Montreal, Que., Approx. $284,459. CD 6/14.

Ont., Toronto — Dist. P. Wks., Hunter Bldg., Ottawa, June 26, dredging Eastern Channel, 31,250,000 cu. yd. and grave, from Mc Namara Construction Co., Ltd., 52 Industrial St., Leaside, Approx. $32,897. CD 6/7.

CONTRACTS AWARDED

▲† California — Bureau Reclamation, Dist. Interior, Sacramento, June 26, earthwork, structures, San Luis Waterway and Road, Exp. Reservoir, Dive. Dam, Delta-Mendota Canal, Central Valley Proj., Spec. 3092, to Western Pacific Constructors, Los Banos City, for $1,192,515. Bids 6-21, awarded 6-29. CD 6-27, under LB.

▲† California — Bureau Reclamation, Dist. Interior, Sacramento, June 26, earthwork, lining, structures, etc., for Friant-Kern Canal, Station 4442 to Station 4722, Friant-Kern Canal Unit, Central Valley Proj., Spec. 3093, to Kern-Tulare Constructors, 2 Ave., Arvin, for $3,333,154. Bids 6-21, awarded 6-29. CD 6-27, under LB.

† California — U. S. Eng., Wright Bldg., San Francisco, June 29, repair substructure of Pier 1, Oakland Army Base, Oakland Harbor, to Chris Olsen Construction Co., 1211 Polk St., San Francisco, for $702,987. Bids 6-20, under LB.

▲† Colorado — Bureau Reclamation, Dist. Interior, Region 1-A, Denver Federal Center, Denver, June 26, earthwork, Lake Granby Pumping Plant, Colo.-Big Thompson Proj., Spec. 3097, to Morrison-Knudsen Co., Inc., Boise, Idaho, and Merritt-Chapman & Scott Corp., 8 Ave., Los Angeles, Calif., for $1,066,940. Bids 6-21, awarded 6-29. CD 6-6.

† Illinois — U. S. Eng., Room 10-S, Custom House & Post Office Bldg., 1114 Market St., St. Louis, Mo., for levee work, Columbia Drainage and Levee Dist. No. 1, Monroe Co., Ill., No. 21-60-50-122, to Hall Construction Co., Hot Springs, for $33,275. Est. $44,440. Bids 6-21, awarded 6-26. CD 6-1.

† Washington — Bureau Reclamation, Dist. Interior, Region 1, Boise, June 21, earthwork, asphaltic membrane lining, pipe lines and structures for lateral W-22, Station 0 to Station 164 plus 70, and sublaterals W-22-1, Station 0 to Station 84 plus 80, Boise-West Canal, Columbia Basin Proj., Spec. 600, to Hoobler Concrete Pipe Co., Indian Park, Calif., for $547,622. Est. $578,114. Bids 6-21, awarded 6-26. CD 6-1.

† Washington — Bureau Reclamation, Dist. Interior, Region 1, Boise, June 21, earthwork, asphaltic membrane lining, pipe lines and structures for lateral E-120 and sub-laterals, Columbia Basin Proj., Spec. 598, to A. A. Tertling & Sons, Inc., 3001 Fairview Ave., Boise, Idaho, $878,717. Est. $1,046,101. Bids 6-21, awarded 6-29. CD 7-5, under LB.

## AIRPORTS

BIDS ASKED

† Alaska — [illegible] PLANT, B.A. [illegible] Apron, 431 x 81 ft. seaplane ramp, 3 hangars, complete power plant consisting three 1,000 kw. Caterpillar Marine Diesel engines with standby engine, distribution and tanks, pumps, etc., for Air Transportation Service, from Alaska Airlines, Anchorage, Alaska, to Point Barrow, Alaska, 1,300 miles N. of Arctic Circle, 1,000 miles from Alaska mainland, 1,000 miles from Siberia, Russia, 1,000 miles from North Pole, extreme cold, short summer, 24 hr. daylight, 24 hr. darkness, extreme isolation, no roads, no trees, no vegetation, no fresh water, no electricity, no communications, no transportation, no fuel, no supplies, no labor, no housing, no hospitals, no stores, no schools, no churches, no recreation, no entertainment, no civilization, no nothing. CD 6-22.

† Fla., Cocoa — ROADS, etc., B.A. About 7.2 mi. Runway 5,000 x 150 ft., Runway 3,000 x 150 ft., Taxiways, Aprons, Blvds., Access Rd., Turnarounds, Parking Areas, Lighting Area, Fuel, Radio Station, Hangar, Utilities, Drainage, Fencing, Land Clearing, Grading, Paving, Seeding, Markers, etc., for Municipal Airport, from Cocoa Blvd. to Leonard St., Cocoa, Brevard Co. Bids 6-23. CD 6-12.

LOW BIDDERS

Ark., Fort Smith — RUNWAYS, City Airport, Proj. No. 3-05-0014-09, to Cook Construction Co., 2414 N. [illegible], for $96,021. CD 6-13.

Pa., Pittsburgh — SEWAGE DISPOSAL PLANT, Allegheny Co., County Office Bldg., June 27, 24,000,000 gal. daily capacity sewage disposal plant, Contr. 12, Chester Pittsburgh Airport Main Trk., from A. J. Celico, York Run, Monroeville, Pa., $144,400. Est. $170,000. CD 6-22.

CONTRACTS AWARDED

† Conn., Windsor Locks — FACILITIES, U. S. Eng., Army Base, Boston, [illegible] Mass., Taxiways at Bradley Field, Windsor Locks, to Walsh Construction Co., 26 Mystic Ave., Medford, Mass., $429,650. Bids 6-15. CD 5-10.

Neb., Fairbury — AIRPORT, City, airport construction, including runway paving, fencing, seeding, markers, etc., for Municipal Airport, from Leavenworth St., Dodds Addition, to W. [illegible] St., Osborn Addition, Jefferson Co., for [illegible] Engineering Co., Lincoln, $55,763. Bids 6-23. CD 6-12.

▲ Tex., Fort Worth — ADMINISTRATION BUILDING, Fort Worth Airport Commission, Amon G. Carter, chmn., Fort Worth, Administration Office and Hangar at new Greater Fort Worth International Airport, to Thos. S. Byrne, Inc., Fort Worth National Bank Bldg., Approx. $2,000,000. Architect: W. [illegible] Associated Architects, 1000 W. [illegible] St., Fort Worth, N. P. Anderson Bldg., architect, Fort Worth.

▲ Tex., Fort Worth — ADMINISTRATION BUILDING, Fort Worth Airport Commission, Amon G. Carter, chmn., Fort Worth, Amon G. Carter Admin. Bldg., at Greater Fort Worth International Airport, to Thos. S. Byrne, Inc., Fort Worth National Bank Bldg., Approx. $2,000,000. Architect: W. [illegible] Associated Architects, 1000 W. [illegible] St., Fort Worth, N. P. Anderson Bldg., architects.

## PUBLIC BUILDINGS

BIDS ASKED

Del., Newark — ADDITAT, Kirkwood, B.A. [illegible] Engineering Laboratory, at Delaware, Newark, for engineering laboratory addition, $100,000. Estimated Bank Trustees & Executors, 144 Dupont St., Plainfield, N.J. Pa. archts. CD 6/5.

N. Y., New York — [illegible] Ave. to [illegible] Ave., from [illegible] St. to [illegible] St., Zone 2, Foundations, Superstructure, Electrical Work, Plumbing, Heating and Ventilating, Fireproofing, Elevators, Foster Wheeler Corp., 165 Broadway, New York City. [illegible] Ave., from [illegible] St. to [illegible] St., Zone 2, Foundations, Superstructure, Electrical Work, Plumbing, Heating and Ventilating, Fireproofing, Elevators, Foster Wheeler Corp., 165 Broadway, New York City.

O., Akron — [illegible] Ave., from [illegible] St. to [illegible] St., Zone 2, Foundations, Superstructure, Electrical Work, Plumbing, Heating and Ventilating, Fireproofing, Elevators, Foster Wheeler Corp., 165 Broadway, New York City.

S. C., Spartanburg — [illegible] Ave., from [illegible] St. to [illegible] St., Zone 2, Foundations, Superstructure, Electrical Work, Plumbing, Heating and Ventilating, Fireproofing, Elevators, Foster Wheeler Corp., 165 Broadway, New York City.

Mass., Bermuda — [illegible] Ave., from [illegible] St. to [illegible] St., Zone 2, Foundations, Superstructure, Electrical Work, Plumbing, Heating and Ventilating, Fireproofing, Elevators, Foster Wheeler Corp., 165 Broadway, New York City.

▲ Mo., Jefferson City — [illegible] Ave., from [illegible] St. to [illegible] St., Zone 2, Foundations, Superstructure, Electrical Work, Plumbing, Heating and Ventilating, Fireproofing, Elevators, Foster Wheeler Corp., 165 Broadway, New York City.

† N. Y., Long Island City — [illegible] Ave., from [illegible] St. to [illegible] St., Zone 2, Foundations, Superstructure, Electrical Work, Plumbing, Heating and Ventilating, Fireproofing, Elevators, Foster Wheeler Corp., 165 Broadway, New York City.

N. Y., Middletown — [illegible] Ave., from [illegible] St. to [illegible] St., Zone 2, Foundations, Superstructure, Electrical Work, Plumbing, Heating and Ventilating, Fireproofing, Elevators, Foster Wheeler Corp., 165 Broadway, New York City.

N. Y., Naparoch — [illegible] Ave., from [illegible] St. to [illegible] St., Zone 2, Foundations, Superstructure, Electrical Work, Plumbing, Heating and Ventilating, Fireproofing, Elevators, Foster Wheeler Corp., 165 Broadway, New York City.

Fla., Sebring — [illegible] Ave., from [illegible] St. to [illegible] St., Zone 2, Foundations, Superstructure, Electrical Work, Plumbing, Heating and Ventilating, Fireproofing, Elevators, Foster Wheeler Corp., 165 Broadway, New York City.

Ala., Fort Richardson — [illegible] Ave., from [illegible] St. to [illegible] St., Zone 2, Foundations, Superstructure, Electrical Work, Plumbing, Heating and Ventilating, Fireproofing, Elevators, Foster Wheeler Corp., 165 Broadway, New York City.

W. Va., Morgantown — [illegible] Ave., from [illegible] St. to [illegible] St., Zone 2, Foundations, Superstructure, Electrical Work, Plumbing, Heating and Ventilating, Fireproofing, Elevators, Foster Wheeler Corp., 165 Broadway, New York City.

N. M., Santa Fe — [illegible] Ave., from [illegible] St. to [illegible] St., Zone 2, Foundations, Superstructure, Electrical Work, Plumbing, Heating and Ventilating, Fireproofing, Elevators, Foster Wheeler Corp., 165 Broadway, New York City.

† Alaska, Chugiak — [illegible] Ave., from [illegible] St. to [illegible] St., Zone 2, Foundations, Superstructure, Electrical Work, Plumbing, Heating and Ventilating, Fireproofing, Elevators, Foster Wheeler Corp., 165 Broadway, New York City.

Ga., Summerville — [illegible] Ave., from [illegible] St. to [illegible] St., Zone 2, Foundations, Superstructure, Electrical Work, Plumbing, Heating and Ventilating, Fireproofing, Elevators, Foster Wheeler Corp., 165 Broadway, New York City.

Ga., Carrollton — [illegible] Ave., from [illegible] St. to [illegible] St., Zone 2, Foundations, Superstructure, Electrical Work, Plumbing, Heating and Ventilating, Fireproofing, Elevators, Foster Wheeler Corp., 165 Broadway, New York City.

N. C., Salisbury — [illegible] Ave., from [illegible] St. to [illegible] St., Zone 2, Foundations, Superstructure, Electrical Work, Plumbing, Heating and Ventilating, Fireproofing, Elevators, Foster Wheeler Corp., 165 Broadway, New York City.

Puerto Rico, Utuado — [illegible] Ave., from [illegible] St. to [illegible] St., Zone 2, Foundations, Superstructure, Electrical Work, Plumbing, Heating and Ventilating, Fireproofing, Elevators, Foster Wheeler Corp., 165 Broadway, New York City.

Fla., Chipley — HOSPITAL, B.A. 8-12, Washington Co., for Lt. Fairfield, Lake City, archt. CD 2-20-48.

LOW BIDDERS

† Mich., Sault Ste. Marie — BARRACKS, U. S. Eng., Detroit, [illegible] Ave., from [illegible] St. to [illegible] St., Zone 2, Foundations, Superstructure, Electrical Work, Plumbing, Heating and Ventilating, Fireproofing, Elevators, Foster Wheeler Corp., 165 Broadway, New York City.

Mo., St. Louis — HOSPITAL, U. S. Eng., 1709 Jackson Pl., Omaha, Neb., June 30, remodeling 44,000 sq. ft. of floor space on 10th floor of Jefferson Barracks Medical Depot, from [illegible] Ave., from [illegible] St. to [illegible] St., Zone 2, Foundations, Superstructure, Electrical Work, Plumbing, Heating and Ventilating, Fireproofing, Elevators, Foster Wheeler Corp., 165 Broadway, New York City. [illegible] Ave., from [illegible] St. to [illegible] St., Zone 2, Foundations, Superstructure, Electrical Work, Plumbing, Heating and Ventilating, Fireproofing, Elevators, Foster Wheeler Corp., 165 Broadway, New York City.

N. M., Los Alamos — COMMUNICATIONS, U. S. Atomic Energy Comm., Los Alamos, June 28, 2 story, fire-resistive communications building, from Small & Margaret, Santa Fe, $127,963. Est. $125,000-$150,000. CD 6-6.

N. C., Cedar Grove — SCHOOL, Orange Co. Bd. Educ., Hillsborough, June 29, general contract [illegible] from Green-Wilson Construction Co., Durham, $253,185. CD 4-5-48.

N. C., Greensboro — STUDENT UNION, Women's College of University of North Carolina, Dr. Lockhart, Asst. Professor, Greensboro, June 29, student union bldg., from [illegible], Green Constr. Co., 324 W. 2 St., Charlotte, $624,600. CD 6-6.

† N. D., Fargo — [illegible] Service Shop, Office of Accounts, Property & Disbursing Officer, Bismarck, June 22, [illegible] from Burns-Watterson, Inc., 1230 Metropolitan Life Bldg., Minneapolis, Minn., $226,900. CD 6-6.

Wash., Woodland — SCHOOL, School Dist., Woodland, June 30, high school, [illegible] Proj. No. 2-2-2411, from Ainsworth, Portland, Ore., $257,000. CD 6-13.

Ont., Ottawa — STOREHOUSE, Dept. Agriculture, Experimental Farm, Ottawa, [illegible] Ave., from [illegible] St. to [illegible] St., Zone 2, Foundations, Superstructure, Electrical Work, Plumbing, Heating and Ventilating, Fireproofing, Elevators, Foster Wheeler Corp., 165 Broadway, New York City. Approx. $450,980.

CONTRACTS AWARDED

Ala., Tuscaloosa — WOMEN'S PATIENT, Alabama State Hospital, to contractor, women's patient bldg. at Bryce Hospital, to W. A. Upchurch Constr. Co. Bed, Fel & Gentry, $281,490. Bids 6-28. CD 6-15.

Calif., Fort Bragg — GYMNASIUM, etc., Fort Bragg, [illegible] from Fort Bragg [illegible] Ave., from [illegible] St. to [illegible] St., Zone 2, Foundations, Superstructure, Electrical Work, Plumbing, Heating and Ventilating, Fireproofing, Elevators, Foster Wheeler Corp., 165 Broadway, New York City. Leggett Valley, new high school, [illegible] to Leggett Valley Elementary School and [illegible] to Westport Elementary School, to Frank M. Foote & Sons, Ukiah, $301,880. Awarded 6-29. CD 2-15.

Calif., San Francisco — SCHOOL, Dist. P. Wks., City Hall, general contract 1 story concrete and steel school, Proj. B-X-1, Bonds Burpee, Richards & Shaw, San Francisco, $714,000. Bids 6-28, under LB.

▲ Conn., Stamford — HOUSING, City of Stamford Housing Authority, Purcell Lane, 192 family unit two-story [illegible] from [illegible] Ave., from [illegible] St. to [illegible] Ave., from [illegible] St. to [illegible] St., Zone 2, Foundations, Superstructure, Electrical Work, Plumbing, Heating and Ventilating, Fireproofing, Elevators, Foster Wheeler Corp., 165 Broadway, New York City. Approx. $3,543,000. Bids 6-22. CD 7-6, under LB.

▲ Conn., Wallingford — HOUSING, Wallingford Housing Authority, 100 family unit 2 story, [illegible] from [illegible] Ave., from [illegible] St. to [illegible] Ave., from [illegible] St. to [illegible] St., Zone 2, Foundations, Superstructure, Electrical Work, Plumbing, Heating and Ventilating, Fireproofing, Elevators, Foster Wheeler Corp., 165 Broadway, New York City. Approx. $1,227,500. Bids 6-22. CD 7-6, under LB.

▲ Conn., Waterbury — HOUSING, City of Waterbury, [illegible] Ave., from [illegible] St. to [illegible] Ave., from [illegible] St. to [illegible] St., Zone 2, Foundations, Superstructure, Electrical Work, Plumbing, Heating and Ventilating, Fireproofing, Elevators, Foster Wheeler Corp., 165 Broadway, New York City. Approx. $2,746,000. Bids 6-23.

† N. M., Los Alamos — STEAM PLANT, Atomic Energy Comm., Los Alamos, [illegible] Ave., from [illegible] St. to [illegible] Ave., from [illegible] St. to [illegible] St., Zone 2, Foundations, Superstructure, Electrical Work, Plumbing, Heating and Ventilating, Fireproofing, Elevators, Foster Wheeler Corp., 165 Broadway, New York City. steam power plant, reinforced concrete and steel construction, [illegible] from [illegible] Ave., from [illegible] St. to [illegible] Ave., from [illegible] St. to [illegible] St., Zone 2, Foundations, Superstructure, Electrical Work, Plumbing, Heating and Ventilating, Fireproofing, Elevators, Foster Wheeler Corp., 165 Broadway, New York City. [illegible] with [illegible] boilers, [illegible] with [illegible] turbo-generators, boiler feed pumps, [illegible] with [illegible] tanks, [illegible] with [illegible] tanks, separators, boiler [illegible] and [illegible] with [illegible] tanks, [illegible] with [illegible] tanks, [illegible] with [illegible] tanks,

LOW BIDDERS

Calif., Oakland ... $479,000.

CONTRACTS AWARDED

Ala., Birmingham ... $459,000

Ala., Birmingham ... $250,000

Fla., ... $500,000

Fla., St. Petersburg ... $400,000

▲ Ill., Great Lakes ... $7,000,000

Ind., Indianapolis ... $400,000

Ia., Council Bluffs ... $455,000

▲+ Kan., Kansas City ... $5,000,000

▲ Kan., Kansas City ... $1,000,000

Md., Alpha (St. Louis 21 P. O.) ... $250,000

Md., Richmond Heights (St. Louis 17 P. O.) ... $360,000

N. Y., New York ... $350,000

N. D., Williston ... $640,000

▲ O., Toledo ... $3,000,000

▲ Pa., Philadelphia ... $3,000,000

▲ S. D., Rapid City ... $1,500,000

▲ Tex., Houston ... $1,275,000

Tex., Houston ... $475,000

Tex., Houston ... $250,000

Tex., Houston ... $480,000

▲ Tex., San Antonio ... $1,000,000

▲ Tex., Fort Worth ... $6,000,000

▲ Wash., Tacoma ... $3,000,000

Ont., Toronto ...


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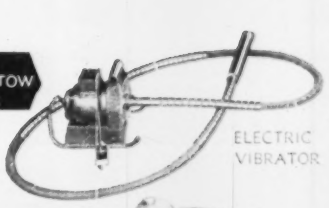

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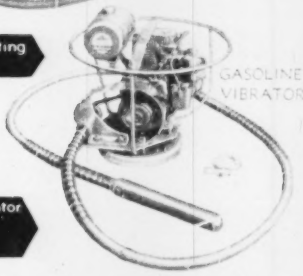

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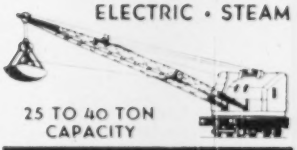

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UNITED STATES STEEL


## INDUSTRIAL BUILDINGS

SOON LETS CONTRACT

Ala., Opelika—WAREHOUSE—Ragland Bros. c/o Sel. mon & Franklin, archts., 321 Poplar St., Chatta. nooga, Tenn.; soon lets contract, grocery warehouse. Approx. $60,000.

Ga., Atlanta—WAREHOUSE, etc.—Allis-Chalmers Mfg. Co., Stanley Dollar, mgr. of sls. & Robert & Co. Assocs., archts., 1 Peachtree St., N. W.; soon lets contract warehouse and office. Approx. $68,000.

Ga., Atlanta—MOTOR FREIGHT TERMINAL—Georgia Highway Express Co., c/o Green, Monnquett & Chambers, archts., Healey Bldg., Birmingham, Ala.; soon lets contract motor freight terminal. Approx. $68,000.

Ga., Atlanta—WAREHOUSE, etc.—Wilkins Theater Supply Co., 3 Mitchell St., Warner & Mackey, archts., 1000 Peachtree St.; soon lets contract warehouse and office. Plans deposit $25.

LOW BIDDERS

Ala., Birmingham—WAREHOUSE, etc.—Pittsburgh Plate Glass Co., c/o E. B. Anderson, archt., Empire Bldg., Birmingham; to Dunn Constr. Co., 1st National Bank Bldg., Atlanta, Ga. Approx. $208,888. CD 6/15.

Pa., Phila.—PLANT—Michael Flynn Mfg. Co., 700 E. Gunther Ave.; orig. plant addns., from Henry E. Reed, Inc., 1727 Sansom St.; Approx. $68,900. Warehouse Eng. Co., 117 S. 17 St., engrs.

CONTRACTS AWARDED

Ala., Birmingham—WAREHOUSE—B.H.S. Warehouse, Inc., warehouse, to Dunn Constr. Co., 1st National Bank Bldg. Approx. $200,000.

Ala., Decatur—HARKINS DECK ADDN.—Consolidated Lumber Co., contractor, changing deck addns., to Rust Eng. Co., Exchange Bldg., Birmingham. Approx. $68,000.

Ala., Jasper—GRAIN ELEVATOR—Owner, c/o contractor, grain elevator, to J. W. Reeves Co., Jasper. $75,000.

Calif., Beverly Hills—SERVICE, etc.—Southern Calif. Gas Co., 810 S. Flower St., Los Angeles, awards bldg. date, incl. addn. alterations to Parsee Service Station, Lucky Santa Monica Blvd., Los Angeles. $76,697. Est. $80,000. Allyn S. Kirk, 420 S. Western Ave., and St., Los Angeles, archts. CD 3/15.

Fla., Miami—WAREHOUSE—Craftsman Village, c/o Mr. Mc Mar, 1412 N. W. 16 Terrace, furniture and equipment dealer, builds. Approx. $68,000.

Fla., Miami—WAREHOUSE—Farreys, Inc., c/o contractor, warehouse, to Akin Constr. Co., 1827 Ponce de Leon Blvd., Coral Gables. Approx. $75,000.

▲ Idaho, Boise—PLANT—Statesman Printing Co., 603 Main St., 4 story, basmt., 96 x 122-ft. newspaper publishing plant, to J. E. Fordyce & Son, Central Insurance Bldg., Boise. Approx. $1,000,000. Bids 5/15. CD 4/15.

Mass., Walpole—PLANT—Kendall Mills, Walpole, mfrs., intersection to Bldgs. F and M, Textile Plant; to Morrison Textile Co., 862 Park Square Bldg., Boston. $75,000.

▲ Pa., Phila.—WAREHOUSE, etc.—American Stores Co., 429 Walnut St., awards 1 story, 40x1,000-ft. brick warehouse, 1 story, basmt., 40x400-ft. refrig. warehouse, to Hughes-Foulkrod Co., 1505 Race St. $3,000,000. Bids 6/15. CD 5/26.

Va., Salem—PLANT—Full Fashion Hosiery Mills, Inc., c/o contractor, plant addn., to Eckard & Eckard, Inc., Roanoke Bldg., Roanoke, Va. Approx. $75,000.

Wash., Spokane—WAREHOUSE, etc.—W. M. Stones, Inc., c/o W. M. Ritzau & Sons, archts., Washington Trust Bldg., awards 40x400-ft. refrigerated steel warehouse, 1 story, basmt., 40x400-ft. refrigerated steel warehouse, to Hughes-Foulkrod Co., 1505 Race St., Phila., Pa. Approx. $100,000. CD 6/15.

Ore., Winston—FACTORY—Long Mfg. Co., 2711 Fir St., Portland, Ore., 1 story, brick, steel and concrete factory, to Mittelstaedt Const. Co., Multnomah Bldg., Portland. Approx. $110,000.

## UNCLASSIFIED

BIDS ASKED

Ont., Manotick—TRANSMITTER STATION—B.A. 7 2c. Canadian Broadcasting Corp., 730 Lyon St., Ottawa; engineering consult. Plans deposit $100.

Wyoming and Nebraska—RURAL DISTRIBUTION LINES—B.A. 2 2c. Nebraska Electric Assn., Lyle Wilson, mgr., 1st Natl. Bank Bldg., Lincoln, Nebr.; to build 69-kv. rural distribution lines in Wyoming and Nebraska. Co. Nebraska, $100,000. CD Eng. Co., 2615 Grove St., Denver, Colo. CD 10/4/49.

† Alaska, Fort Richardson—ELECTRIC INSTALLATION, etc.—B.A. 8 2c. Anchorage, Alaska, Dist. Engr., Alaska Road Commission, Box 1481, Anchorage; to install electric power and electrical distr. facilities, Fort Richardson, Alaska. Plans deposit $50. CD 7/31/50.

† Montana—TRANSFORMER OIL STORAGE TANKS—B.A. 8 2c. Eastern Montana Dist., Bureau of Reclamation, P.O. Box 2553, Billings, Mont.; to furnish and deliver 2 transformer oil storage tanks for Hungry Horse Reservoir, Hungry Horse Proj. Spec. 319. L. N. Peterson, Supt.

N. C., Morehead City—PORT FACILITIES—B.A. 8 15 2c. State Ports Authority, c/o Division of Ports, Raleigh; port facilities, incl. 1,200-ft. steel pile bulkhead, timber

All, transf. stat., wheelchair, office, rail and ry. connections, Geo. Wertz Corp., Corcoran Bldg., Durham, Md., engrs.

SOON LETS CONTRACT

Fla., Fort Myers, MOTOR COURT, Jas. Reid, Jr., c/o Curtis B. Schrepp, archt., 2701 Hoover Blvd., Miami, soon lets contract; motor court. Approx. $50,000.

Missouri, TRANSMISSION LINES, Sho-Me Power Co., operative, Marshfield, soon lets contract for 69 kv. transmission line, about 60 mi. of single circuit steel & wood H-frame construction, from Fredericktown to Piedmont. Engr: Black & Veatch, Consulting Engrs., Plaza Square, 4520 Main, Kansas City, Mo. (CD 22 1)

South Dakota, RURAL DISTRIBUTION LINES, Tri-County Electric Assn., Inc., Howard, soon lets contract for 242 mi. electric lines, 7 power and transformer substations. $225,000. Engr: Rural Electrification Administration, Washington, D. C. (CD 22 1)

LOW BIDDERS

† Calif., Richmond, BALLAST, TRACKWORK, FACILITIES, Santa Fe Ry., Los Angeles, low bdr. Engr: Santa Fe Engrs., Railway Exchange Bldg., Chicago. (CD 22 1)

Idaho, RURAL DISTRIBUTION LINES, Lincoln County Power District No. 1, Shoshone, low bdr. Engr: Rural Electrification Administration, Washington, D. C. (CD 22 1)

$78,469.

† N. D., Valley City, [illegible], low bdr. Engr: [illegible], Valley City. (CD 22 1)

$67,000. (CD

N. S., Baracho[illegible], low bdr. Engr: [illegible], Halifax. (CD 22 1)

$79,225.

CONTRACTS AWARDED

Ala., Cordova, [illegible], Cordova Mining Co., Cordova. (CD 22 1)

$159,514.

Fla., Hollywood, [illegible], Hollywood. (CD 22 1)

$62,000.

Iowa, RURAL DISTRIBUTION LINES, Northwest Rural Public Power District, Sioux Center, [illegible]. (CD 22 1)

$367,000.

Missouri, RURAL DISTRIBUTION LINES, Northeast Missouri Electric Power Cooperative, Palmyra, [illegible]. (CD 22 1)

$121,677.

▲ Texas and Illinois, [illegible], Texas Power & Light Co., Dallas, and Illinois Power Co., Decatur, to A. Johnson & Co., Inc., Houston, Tex., and Austin Bridge Co., Dallas, Tex. Engr: Texas Power & Light Co., Dallas. (CD 22 1)

$117,000,000.

▲ Texas, Louisiana, Mississippi, [illegible], Texas Power & Light Co., Dallas, and Louisiana & Arkansas Ry., Shreveport, La., to A. Johnson & Co., Inc., Houston, Tex., and Austin Bridge Co., Dallas, Tex. Engr: Texas Power & Light Co., Dallas. (CD 22 1)

$10,560,000. Approx. $10,800,000.

McAlester to Atoka, Tex., [illegible], Texas Power & Light Co., Dallas, and Louisiana & Arkansas Ry., Shreveport, La., to A. Johnson & Co., Inc., Houston, Tex., and Austin Bridge Co., Dallas, Tex. Approx. $15,720,000.

$11,040,000

Tex., Houston, [illegible], Houston Lighting & Power Co., Houston. (CD 22 1)

$600,000.

Alberta, GAS MAIN, Northwestern Utilities, Ltd., Edmonton. (CD 22 1)

$100,000. (CD 4 3)

▲ Manitoba, [illegible], Manitoba Power Commission, Winnipeg, to Dominion Bridge Co., Ltd., Montreal, Que., and Canadian Bridge Co., Ltd., Walkerville, Ont. (CD 22 1)

Approx. $1,232,000.

Quebec, TRANSMISSION LINE, Quebec Power Co., Quebec. (CD 22 1)

$350,000.

Que., Bedford, [illegible], Bedford. (CD 22 1)

$135,000.

## PROPOSED PROJECTS

### WATER SUPPLY

Fla., Lake Worth, City Water Dept., Approx. $250,000. Engrs: [illegible], Palm Beach. (CD 22 1)

Idaho, Nampa, [illegible], Nampa. (CD 22 1)

$250,000.


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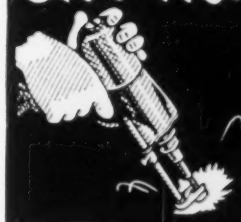

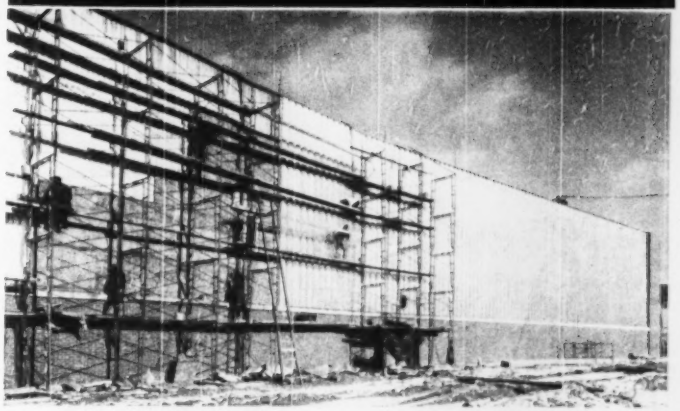

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For installing most any type of roofing and siding material—corrugated steel, aluminum, asbestos, protected metal, or flat asbestos-cement—the Nelson topside method is *tops*. It's being specified by leading engineers and architects, approved by material manufacturers, and used by alert roofing and siding contractors everywhere.

Nelson studs for securing insulating board are end-welded with the portable stud welding gun in a split-second.

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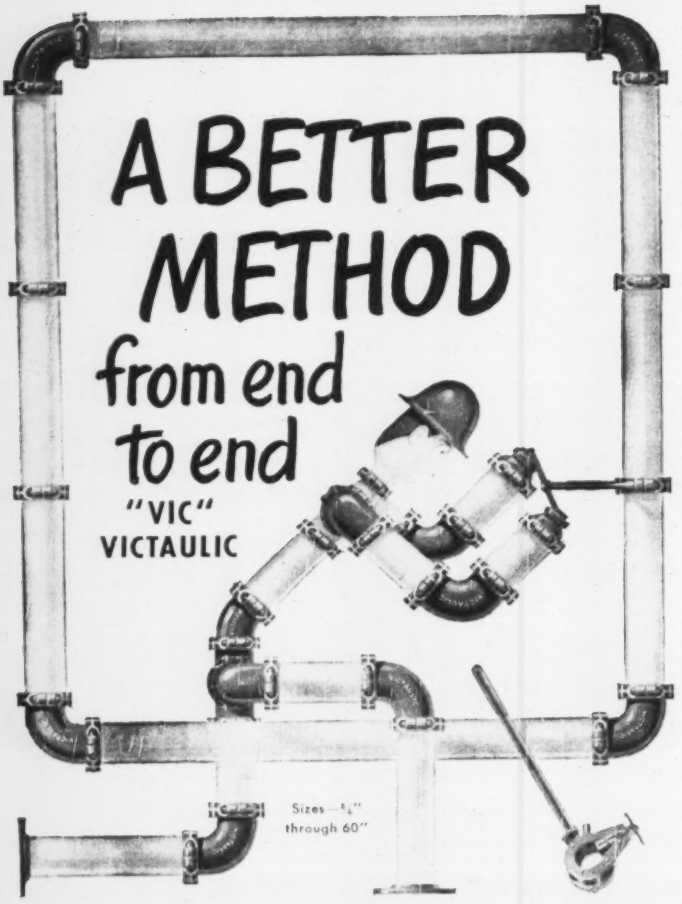


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**PIPE COUPLINGS AND FITTINGS**


Kan., Spring Hill—City, WW, $101,000. H. R. Hunter, 109 W. English St., Wichita, consult. engr. CD 12/15/49.

Miss., Artesia—Town, Proj. 22-P-1015, WW improvs, $57,000. Leland B. Cook, P.O. Box 240, Tupelo, consult. engr.

Mo., Sikeston—City, Municipal Carroll, mayor, City Hall, sewer bonds, WW, offers, extens., incl. water filtration plant, water mains, etc., $400,000. Russell & Axon, 506 Olive St., St. Louis 2, Mo., consult. engrs. 20 4/28.

▲ N. C., Charlotte—City, H. A. Vanney, mgr., City Hall, sewer bonds, Proj. 29, WW, enlarging, extens., WW sys., $1,750,000. CD 6/27/44.

Tenn., Union City—City, elevated water storage tank, Proj. 50-P-1022, $56,000; water supply improvs., treatment plant, Proj. No. 50-P-1023, $150,000. Russell & Axon, 408 Olive St., St. Louis 2, Mo., consult. engrs.

Tex., Arlington—City, WW sys., improv. and extens., $125,000; water supply, $75,000. Jos. J. Rady, Insurance Bldg., Fort Worth, consult. engr.

Tex., San Antonio—(P. O. Burke & Sons, Inc.), 4320 W. Zarzamora St., water lines, $18,000; (W. C. Gorman), Proj. 550,000, W-2 acre tract south of Military Dr., $60,000; 2½ acre tract W. of W. W. Mc-Allister property off Palo Alto Ave., $40,000; 22½ acre tract off Quintle Creek area, $40,000. Harmon & Drobnock, Mining Exchange Bldg., Denver, Colo., land planners. Reynolds Arbuckle, Watson Bldg., site selection engr.

Wis., Fairchild—Village, WW sys., $104,842.

Alta., Red Deer—Municipality, WW, $125,000. A. B. Samuel, Town Hall, town engr.

Que., Iberville—Village, Y. Thiery, engr., water supply sys. "Domaine du Sud." Approx. $412,000. Lasnde & Nadeau, Cement Bldg., Montreal, engrs.

## SEWERS, WASTE DISPOSAL

Calif., Crestline—County Sanitation Dist., Court House, San Bernardino, $176,000 bonds, Iss. 12, treatment plant and sewers. CD 3/13/46.

Calif., Lake Arrowhead—Lake Arrowhead Sanitation Dist., Court House, San Bernardino, sewage collection sys., and treatment plant, $656,600. Sewer election 7/18. F. L. Clarke, Anaheim Bldg., San Bernardino, engrs.

Fla., Marianna—City, revenue bonds, improvs., extens. to sewerage sys., Approx. $200,000. Smith & Gillespie Co., Richards Bldg., Jacksonville 1, engrs.

Fla., Miami Beach—City, sewage treatment plant addn., 74 St. and Collins Ave., $300,000. Marion Perrine, 29 Biscayne Blvd., engr. 13/4/50.

Ill., Libertyville—Village, sewage sys., $290,000. Consulting Engrs. Turnbull & Associates, 53 W. Jackson Blvd., Chicago, Ill. 12, consult. engrs.

Ill., Rockford—City, Mayor Percy C. Heward, City Hall, offers $185,000 bonds, sewage disposal plant and sewers, storm sewers, and sanitary sewers, etc.

Md., Rockville—(City Council), C. L. Keefer, mayor, City Hall, sewage system and sewer, $100,000. Whitman, Requardt & Assoc., 1304 St. Paul St., Baltimore, engrs.

Maine, Auburn—Sewage Treatment Works, sanitary sewage treatment works, $100,000. R. J. Lilly, Auburn, engr.

Miss., Columbus—(Proj. 22-P-1119, sewerline sys., $144,065. Proj. 22-P-1020, collection sys., $311,800. Proj. 22-102, trunk sewer, $305,020. Proj. 22-P-1032, collection sys., $169,829. J. H. Glassford & Co., P.O. box 1, engrs.

Mo., Overland (St. Louis, 14, P.O.), City, Sherman A. Smith, mayor, City Hall, storm water sewer, sanitary sewer, $644,000. Proj. 2811, for Area 2, engrs.

N. J., Extonstown—Town, sewerage sys. and treatment, $297,550.

▲ N. C., Charlotte—City, H. A. Vanney, mgr., City Hall, sewer bonds, Proj. 29, WW, enlarging, extens., WW sys., $2,000,000. CD 6/27/44.

S. C., Georgetown—City, sewer improvs., Proj. 1, $133,286. John McCrady Co., 9 State St., engrs.

Tenn., Union City—City, sewer collection sys., Proj. 50-P-1022, $60,000; treatment plant, Proj. 50-P-1023, $225,000. Russell & Axon, 408 Olive St., St. Louis 2, Mo., consult. engrs.

Tex., Arlington—City, WW sys., improv. and extens., $125,000; water supply, $75,000. Jos. J. Rady, Insurance Bldg., Fort Worth, consult. engr.

Tex., Mesquite—City, sewer bonds, $70,000. Fort Worth, engr.

Tex., San Antonio—(P. O. Burke & Sons, Inc.), 4320 W. Zarzamora St., water lines, $18,000; (W. C. Gorman), Proj. 550,000, W-2 acre tract south of Military Dr., $60,000; 2½ acre tract W. of W. W. McAllister property off Palo Alto Ave., $40,000; 22½ acre tract off Quintle Creek area, $40,000. Harmon & Drobnock, Mining Exchange Bldg., Denver, Colo., land planners. Reynolds Arbuckle, Watson Bldg., site selection engr.

Wis. Whitehall—City sewage and sewage treatment plant. $173,470. S. P. Hall Eng. Co., 128 Graham Ave., Eau Claire, consult. engr.

Que. Shawinigan Falls—Municipality, incinerator. $250,000. Robert Bonin, City Hall, engr.

## BRIDGES

Ia. Denison—[illegible] $350,000

Neb. Niobrara—[illegible] $300,000

▲ N. C. Charlotte—[illegible] $1,500,000. CD 6-15-43.

Que. Drummondville—[illegible] $350,000

## STREETS AND ROADS

Ala. Fort Payne—[illegible] $275,000

Fla. Fort Walton—[illegible] $103,000

Ga. Americus—[illegible] $150,000

Ill. Decatur—[illegible] $319,415

Ill. Decatur—[illegible] $364,000

Ill. Decatur—[illegible] $320,712

Ill. Decatur—[illegible] $186,488

Ill. Decatur—[illegible] $133,995

Ill. Decatur—[illegible] $258,595

Ill. Marion—[illegible] $142,100

Ill. Mt. Zion—[illegible] $107,783

▲ N. M. Albuquerque—[illegible] $2,500,000.

N. C. Charlotte—[illegible] $600,000

† Tenn. Tullahoma—[illegible] $100,000 $65,000

Tex. San Antonio—[illegible] $60,000

## EARTHWORK, WATERWAYS

† Iowa—[illegible]

B. C. Esquimalt—[illegible] $215,000.

B. C. Lewes River—[illegible] $110,000.

B. C. Vancouver—[illegible] $100,000

Que. St. John—[illegible] $200,000.

▲ Saskatchewan—Govt. of Canada, Dept. Agriculture (Ottawa, Ont.) dam on east side of south Saskatchewan River to obviate flooding Qu'Appelle Valley, Qu'Appelle. Approx. $5,000,000. dam on south Saskatchewan River between Elbow and Outlook. Approx. $5,000,000. CD 1-25-45.

## LATIN AMERICA

Mexico, Mexico City—[illegible] $250,000

Mexico, Mexico City—[illegible] $300,000

Mexico, Villa Obregon—[illegible] $250,000

## PUBLIC BUILDINGS

▲ Calif. Compton—[illegible] $5,500,000

Conn. Beacon Falls—[illegible] $500,000

Del. New Castle—[illegible] $650,000

Fla. Detroit—[illegible] $460,500

Fla. Jacksonville—[illegible] $400,000 $250,000

▲ Ill. Aurora—[illegible] $2,000,000

Ia. Sioux City—[illegible] $400,000

Ky. Lexington—[illegible] $400,000

Mass. Everett—[illegible] $600,000

▲ Mich. Ann Arbor—[illegible] $4,000,000

▲ N. Y. Port Chester—[illegible] $1,000,000

Youngstown—[illegible] $450,000

▲ Pa. Grove City—[illegible] $1,000,000

Pa. Muncy—[illegible] $395,200

Tenn. Cookeville—[illegible] $452,000

▲ Tex. Center—[illegible] $1,400,000

Tex. Grand Prairie—[illegible] $350,000 $350,000

▲ Wash. Everett—[illegible] $1,200,000

N. B. Woodstock—[illegible] Approx. $675,000

Sask. Lloydminster—[illegible] $450,000

## COMMERCIAL BUILDINGS

▲ Calif. Burbank—HOSPITAL—[illegible] $3,000,000

▲ Calif. Lakewood—SHOPPING CENTER—Joseph K. Eichenbaum, c/o Albert C. Martin & Assocs., archts., 333 S. Beaudry St., Los Angeles; Lakewood Center shopping ctr., $30,000,000.

▲ Calif. Los Angeles—[illegible] $2,000,000.

▲ Ill. Chicago—APARTMENT—[illegible] $4,000,000

Ky. Lexington—[illegible] $450,000

▲ Mass. East Springfield—[illegible] $2,000,000

Mass. Jamaica Plain—APARTMENT—[illegible] $950,000

Mass. Jamaica Plain—APARTMENT—[illegible] $750,000

▲ Mich. Detroit—[illegible] $10,000,000

▲ [illegible] $625,000

▲ [illegible] $1,250,000

▲ [illegible] $1,547,000

▲ [illegible] $1,250,000

▲ Tex. Fort Worth—[illegible] $4,000,000

▲ Tex. Houston—APARTMENTS—[illegible] $1,500,000

▲ Tex. Houston—[illegible] $4,000,000 $2,400,000

▲ Tex. Mesquite—[illegible] $4,500,000

Tex. San Antonio—[illegible] $400,000

▲ Wash. Bellevue—[illegible] $30,000,000

## INDUSTRIAL BUILDINGS

Mo. St. Louis—[illegible] $400,000

Man. Winnipeg—[illegible] $750,000

## UNCLASSIFIED

▲ Alabama—[illegible] $1,485,000

Alabama—[illegible] $120,000

Arkansas—[illegible] $275,000

▲ Calif. Santa Ana—FAIR GROUNDS—32nd Agricultural District Orange County Fair plant, by Bennett & Bennett, 1126 E. Colorado St., Pasadena; Orange County Fair Directors. $6,000,000.

Conn. Middletown—TUNNEL—State Highway Commissioner Thatcher Brownell, 114 State Capitol, Hartford, 700 ft. tunnel connecting power plant, Connecticut State Hospital (Mental). $165,000.

Fla. Fort Lauderdale—PARK FACILITIES—Florida State Improvement Comm., Tallahassee; Hugh Taylor Birch State Park facilities. Proj. B.P.1936. $461,000. Frank G. Carr, c.e. owner, engr.

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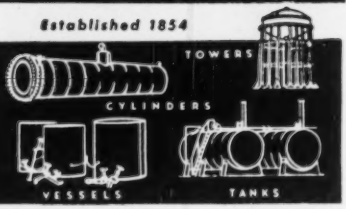


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Idaho—RURAL DISTRIBUTION LINES—Lost River Electric Cooperative Inc., P.O. Box 201, 30 mi. 60 kv distr. lines and 2 substations, Mackay. $200,000. T. C. Adams, 14 W. S. Temple St., Salt Lake City, Utah, consult. engr. CD 5-24

Indiana—RURAL DISTRIBUTION LINES—Johnson County R.E.M.C., Franklin, 14 mi. rural distr. line, headquarters facilities, sys. improv., Johnson Co. $250,000.

Iowa—RURAL DISTRIBUTION LINES—Buena Vista County Rural Electric Cooperative, Storm Lake, 25 mi. south line and 32 mi. tie line, Buena Vista Co. $103,000. Brown Eng. Co., K. P. Bldg., Des Moines, consult. engr.

Iowa—RURAL DISTRIBUTION LINES—Cooperative Power Co., St. Ansgar, 63 mi. rural distr. lines, sub., improv., sys. wide, and headquarters Bldg., Mitchell Co. $226,000. Stanley Eng. Co., Hershey Bldg., Muscatine, consult. engr.

Iowa—RURAL DISTRIBUTION LINES—Greene Co. Rural Electric Cooperative, Jefferson, 5 mi. rural distr. line and conducting previously approved construction, Greene Co. $155,000. Brown Eng. Co., K. P. Bldg., Des Moines, consult. engr.

Ia.—Sioux City—CONDUIT—City, conduit exten. $120,000. Thomas Russell, Sioux City, city engr.

Mo.—El Dorado Springs—POWER PLANT, etc.—City, municipal springs power plant exten., generating equip. $110,000.

Oregon—RURAL DISTRIBUTION LINES—Umatilla Electric Cooperative Assn., Hermiston, 105 mi. rural distr. line, 29 mi. transmission line and sub. improv., Umatilla Co. $660,000.

South Dakota—RURAL DISTRIBUTION LINES—Sioux Valley Empire Electric Assn., Inc., 122 mi. rural distr. lines, Minnehaha Co. $180,000.

Tennessee—RURAL DISTRIBUTION LINES—Volunteer Electric Cooperative, Decatur, 145 mi. rural distr. lines and sys. improv., Meigs Co. $520,000.

Tenn.—Martin—GAS TRANSMISSION, natural gas sys., Martin Gas Co., $235,000. Russell & Axon, 408 S. 2nd St., St. Louis, 2, Mo., consult. engrs.

Tenn.—South Fulton—GAS SYSTEM, natural gas sys., P.O. Box 1200, $140,000. Russell & Axon, 408 S. 2nd St., St. Louis, 2, Mo., consult. engrs. CD 5-17

▲ Texas, Louisiana, Arkansas, Missouri, Illinois, Indiana and Michigan—GAS PIPE LINE—Valley Gas Pipe Line Co., Mercantile Main St. Building, Tex. and Co. Exchange Bldg., Atlanta Natl. Bldg., Fort Addison, 1,278 mi. 24 and 30 in. natural gas pipe line, 24 in. line between Houston, Tex. and Natchez, Miss., Delta, Ark., Atlanta, Ark., Cape Girardeau, Mo., Evansville, Ind., Hartford, Ark., Terre Haute, Ind., Kalamazoo, Mich., and near Detroit, $134,680,000; approx. 162 mi. 24 in. pipe line between Corpus Christi, Tex. and Bay Ltd., below Aransas Pass, including the Gulf of Mexico (under water), through Nueces, Texas, near Sabine Pass, incl. distr. systems, Vermilion Parish, La., $9,820,000; stations and feeder lines, Goliad, Tex., $33,500,000.

Washington—RIVER DIVERSION DAM—Grant County Public Utility Dist. No. 2, Ephrata, rock hydro. dam, Columbia River, $588,000. Stevens & Koepf, engrs., Portland. Date unkn., engrs. CD

Wisconsin—RURAL DISTRIBUTION LINES—Lafayette County Rural Electrification, 2 mi. rural distr. lines, headquarters facilities, Lafayette Co. $102,000.

Wyoming—RURAL DISTRIBUTION LINES—Carbon Power & Light Co., Rawlins, rural distr. lines and sys. improv., Carbon Co. $180,000.

British Columbia—PIPE LINE—Westcoast Transmission Co., Ltd., Vancouver, natural gas pipe line, Alberta-B. C. border to Dawson Creek, $568,970.

B. C.—Vancouver—FREIGHT SHED—Board of Harbour Comrs., Vancouver, freight shed, Fishing Pier, Approx. $100,000. R. Blair, engr.

B. C.—Westview—WHARF—Board of Harbour Comrs., Vancouver, wharf, $180,000. R. Blair, engr.

Ont.—Brantford—WATER SYSTEM—City, water improv., $140,000. Dist. Planning & Development Board, engrs.

Ont.—Brockville—WATER SYSTEM—Thousand Islands Water Co., to prevent flooding into lower level, $140,000. Dist. Planning & Development Board, engrs.

Ont.—Port Hope—LIBRARY—Addition to city, Port Hope Public Library, Approx. $104,000. R. Blair, engr.

Ont.—Toronto—[illegible] $236,000.

▲ Que.—Hebertville—MACARATAIS—[illegible] $3,000,000.

Que.—Longueuil—APARTMENTS—Roman Corp., Ltd., Montreal, 20 flats, 2 stories, by P. Lafontaine, 648 Park Ave., Montreal 2 (Serv. Report) $175,000.

Que.—Montreal—APARTMENTS—[illegible] $200,000.

Que.—Montreal East—APARTMENTS—Mont-Marie, plan [illegible] $175,000. N. Langelier, [illegible]

Que.—Romuald—[illegible] $200,000. Dist. P. Wks., Hunter Bldg.

# CONSTRUCTION REPORTS-Second Section

## WATER SUPPLY

BIDS ASKED

▲ Tex. Dallas (U.S.A.) ... $...

LOW BIDDERS

O. Cleveland ... $250,000

O. Mentor Filtration Plant ... $134,670

Tex. Hartsville ... $153,978

† Tex. Roma ... $112,856

## SEWERS, WASTE DISPOSAL

BIDS ASKED

Ky. Versailles (U.S.A.) ... $...

Que. Montreal (U.S.A.) ... $...

Minn. St. Louis Park (U.S.A.) ... $...

## BRIDGES

BIDS ASKED

STATE HIGHWAY LETTINGS

July 25 — Maryland; Massachusetts
July 26 — New York; Rhode Island
July 27 — Ohio
July 28 — Minnesota; Mississippi; Pennsylvania
August 1 — Maryland
August 2 — California; New York
August 3 — California

Ala. (12 counties) ... $...

Ky. Vanceburg (U.S.A.) ... $...

Minn. St. Cloud (U.S.A.) ... $...

Calif. Oakland (U.S.A.) ... $...

LOW BIDDERS

▲ New York ... $...

▲ New York ... $...

▲ New York ... $...

CONTRACTS AWARDED

▲ New Jersey, New Jersey Turnpike, Bonds, Mercer, Middlesex, Monmouth, Ocean, Somerset, Union, Warren Counties ... $1,080,925

New Jersey, New Jersey Turnpike, Bridges ... $372,867

▲ New York ... $1,467,559

▲ New York ... $2,375,781

## STREETS AND ROADS

BIDS ASKED

STATE HIGHWAY LETTINGS

July 25 — Maryland; Massachusetts
July 26 — New York; Rhode Island
July 27 — Ohio
July 28 — Minnesota; Mississippi; Pennsylvania
August 1 — Maryland
August 2 — California; New York
August 3 — California

† Mississippi (U.S.A.) ... $3,344,346

Ala. (6 counties) ... $...

Ky. Versailles (U.S.A.) ... $...

Minn. St. Cloud (U.S.A.) ... $...

Calif. Oakland (U.S.A.) ... $...

LOW BIDDERS

▲ New York ... $494,850

▲ New York ... $476,128

▲ New York ... $1,044,315

▲ New York ... $647,000

▲ New York ... $60,812

▲ New York ... $2,178,676

▲ New York ... $1,945,504

▲ New York ... $147,245

▲ New York ... $53,662


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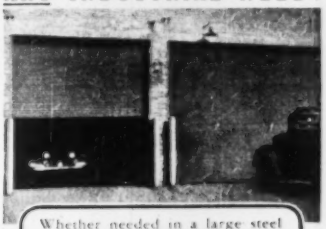

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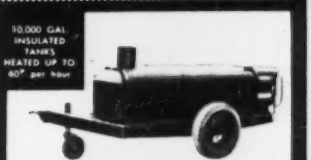

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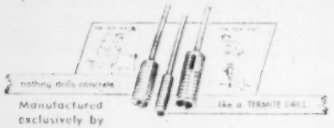


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drainage structure, etc. in Wood River Drainage & Levee Dist., near Alton, Madison Co., Item 11-G, CHENG 23-065-50-90 to Midland Constructors, Inc., 22 W. Adams St., Chicago. $518,872. Est. $415,000. Bids 5-16. CD 5-23. under LB.

▲† Nebraska—Bureau of Reclamation, Dist. Director, Trenton, Construct Trenton Dam, Frenchman-Cambridge Unit, Missouri River Basin Project, 5 miles NE of Trenton, Co., Inc., 500 E. Green St., Pasadena, Calif., Ralph A. Bell, 901 E. Penrose Ave., Whittier, Calif., and United Concrete Pipe Corp., 13745 Stewart Ave., Baldwin Park, Calif. $4,726,557. Est. $5,-[illegible]. Bids 6-23. Awarded 6-30. CD 7-5 under LB.

▲† New Mexico—U. S. Engr., Box 1538, Albuquerque, [illegible] Acres, Inc., and Ross A. [illegible] Corp., Denver, Colo., [illegible] Co., Inc., Albuquerque, [illegible] Co., Albuquerque, [illegible] Co., Albuquerque, [illegible] Co

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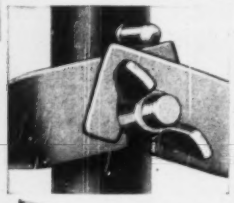

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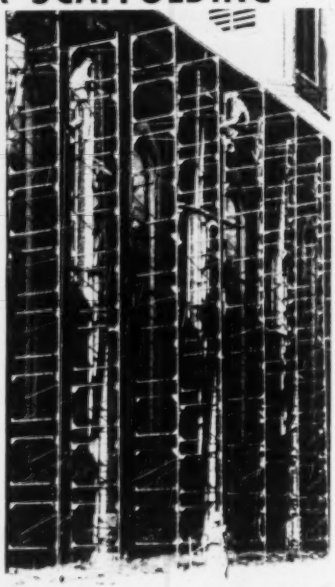

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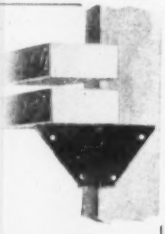

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## PUBLIC BUILDINGS

BIDS ASKED

▲ Colo., Denver—HOUSING—B.A. 7-25—Denver Housing Auth., 2449 Kalamath St., Denver 2, Colo. 1 and 2 story dwellings, 50 units, $3,000,000. Plans deposit $25. Extended date. T. H. Hunt & Co., 214 St. Francis and engrs., CD 6-27.

N. Y., Brooklyn—HOUSING—B.A. 7-26—New York City Housing Auth., 49 Park Pl., New York. Zone 7. Heating and ventilating for Sect. 11, Incl., Bldgs. numbered 1 to 13, inclusive of Farragut Houses (Proj. No. NYS 2-4), in area bounded by Sands, Navy, Jay and Hudson sts., incl. area at northeast corner of Sands St. and to Nassau St. Plans deposit $75. Extended date. CD 6-19.

Pa., Warren—CHAPEL, etc.—B.A. 7-26—General State Auth., 18 and Herr Sts., Harrisburg, general contract, heating, plumbing and electrical work, classroom and recreation bldg. at Warren State Hospital. Separate bids. Hanna & Stewart, Merchants Bank Bldg., Sharon. A. R. Jones, Erie Daily, 24 mos. CD 2-2.

Wis., Whitefish Bay—SCHOOL—B.A. 7-26—School Dist. No. 1, 5811 N. Lake Dr., Milwaukee 17, Wis. Addition, alterations. $267,000. Plans deposit $25. Geo. Nimmer & Sons, 733 N. Jefferson St., Milwaukee. Jacobs, 2 mos.

Ga., McRae—HOSPITAL—B.A. 7-27—McRae Tuberculosis Hospital Auth., McRae. Bids for $450,000 hospital. Barnes & Thornburg, Interstate Bldg., Atlanta. CD 12-21.

B. C., Dawson Creek—B.A. 7-26—Mun. Engr., Dawson Creek, Que. for Elem. Schools, 1 story, 4 classrooms, 2 story, 8 classrooms. Architect, Sharpe & Thompson, 1661 W. Broadway, Vancouver. CD 11-24-49.

▲ Ill., Glenview—HIGH SCHOOL—B.A. 7-27—Glenview Twp. Community High School Dist., Glenview, Ill. Architect, Perkins & Will, 520 W. Jackson Blvd., Chicago. CD 11-24-49.

▲† Ia., Newton—SCHOOL—B.A. 7-27—Sec. Educ., Des Moines. CD 1-19.

Kan., Lawrence—JOURNALISM—B.A. 7-27—J. Berge, Bldg. Supt., Statehouse, Topeka, remodeling old Fowler Shops, Mass. Allen white school of journalism, Univ. of Kan., Lawrence. Plans deposit $10. CD 6-27.

▲ Md., Catonsville—HOSPITAL—B.A. 7-27—State Roads Comm., Rm. 211, Post Office Bldg., Baltimore 2. 1 story, 200 beds, 1 and 2 story, 50 beds, 1 story, 50 beds, 1 story, 50 beds, 1

housing about 200 persons; $800,000. J. G. Link & Co., 111 N. Montana St., Butte, archits. CD 12-27-49.

Ky., Albany—HOSPITAL—B. A. Abell, 8-1 Clinton Co., Albany, hospital, $500,000. Offs. & annex, Tyler Bldg., Louisville, archits.

† Ky., Lexington—UTILITY SHOP and GARAGE—B. A. 8-1—veteran's Admin., Vermont Ave. between H and I Sts. N.W., Wash. 25, D. C.; utility shop and garage No. 40, Spec. 50122, Proj. 4-4012.

Tex., Dallas—HIGH SCHOOL—B.A. 8-1—Dallas Independent School Dist., Award and Royal Sts., Booker T. Washington High School, $1,141,134. Plans dated $25. Dunlavy & Hill, 501 Jackson St., archits. CD 2-14-49.

Tex., Dallas—SCHOOL—B.A. 8-1—Dallas Independent School Dist., Award and Royal Sts., school for exceptional students or handicapped children; site of Hyer School, $166,000. Plans dated $2. Dunlavy & Hill, 2108 N. St. Paul St., archits. CD 2-14-49.

† Idaho, Arco—SCHOOL—Bids 8-1—Arco Joint School District No. 29, Box 324, Idaho Falls, remodeling 7 buildings at Atomic Energy Commission Reactor Testing Station, Arco; Public Works Bldg., Idaho Falls, $10. Arthur Evans & Brazier, 25 W. Second St., Salt Lake City, Utah, archits. engrs., est. $2,250,000.

Ont., Orangeville—HOSPITAL—B. Award 1-6—C. Gordon Logan, 12 King St., E., Toronto, archit. for Orangeville Hospital Board, Dr. W. A. Woodhouse, chmn., Orangeville. Approx. $450,000. CD 12-22-49.

LOW BIDDERS

▲ Conn., Hartford—SCHOOL—Bids 6-29—Hartford Board of Education, 249 High St., Hartford, 2 elementary schools, Bowles Park and Burns St.; Hartford Public High School addition, Broad St. Bowles Park School, Bowles Park, Hartford, Hoffman Construction Co., 1 Constitution Plaza, Hartford, $1,023,967. Burns St. School, Burns St., Hartford, Hoffman Construction Co., 1 Constitution Plaza, Hartford, $709,270.

Ill., Joliet—CIVIL AIRPORT—Bids 6-27—Joliet Park District, Joliet, airport development, Markbreit & Co., 27 W. Jackson Blvd., Chicago, general contract, Lefebvre Construction Co., 2140 N. Ottawa St., Joliet, $209,270.

▲ Md., Mt. Wilson—HOSPITAL—Bids 6-29—Maryland State Dept. of Public Works, Lee Bldg., Baltimore, Zone 1, John L. Whitehurst, chief engr., 2 units to State Hospital for Tuberculosis, steel and concrete construction, Cranston-Clemmens Construction Co., 1000 Connecticut Ave., N. W., Wash. 6, D. C., $3,021,000. CD 6-15.

Mass., Cambridge—HOUSING—City Housing Authority, 1815 Massachusetts Ave., Cambridge, 2 two-story frame and brick dwellings, Harvard and Prospect Sts., Wadsworth Heights Housing Project, 200-unit addition, State Aided Housing Project, Mattapan, $528,000. Thompson & Lord Co., Inc., 79 Milk St., Boston, $618,000. CD 6-22.

Mass., Newton Centre—SCHOOL—City, P. Phillips, Commissioner of Buildings, 12 Centre St., Newton Centre, addition to Day High School, Walnut Park & Sixth Streets, Brookline, $637,800. CD 6-23.

Mass., Pittsfield—SCHOOL—City, School Dept., Pittsfield, July 7, 2 story, 90x130 ft. brick, steel structure, Lyonnaise Construction and Bridge Co., 124 State St., Springfield, $792,520. CD 6-22.

† Mich., Calumet—BARRACKS—U.S. Engr., 1819 Merchandise Mart, Chicago 54, Ill., barracks and mess buildings, Keweenaw County, Fort Wilkins, Lake Superior, Keweenaw Point, Copper Harbor, Eagle River, $636,000. CD 5-15.

Minn., Columbia Heights—SCHOOL—Bd. Educ., F. C. Jaskow, Jr., June 23, general contract 3 story, burnt, high school addition, alterations, from Stanford Street, Jct. 250 Builders Exchange Bldg., Minneapolis, $528,106. CD 6-22.

▲ N. Y., Brooklyn—CITY PRISON and REMAND SHELTER—Dept. Pub. Works, Municipal Bldg., New York, Zone 7, general contract, 12 story prison and shelter, Atlantic Ave., Boerum Pl. and Schermerhorn St., Brooklyn, Gallagher & Costigan, 300 Jamaica Ave., Jamaica, $6,391,447. Plumbing, from Jamaica Ave. to 36-16 31 St., Long Island City, $633,912. Heating and refrigerating, from Metropolitan Expressway to Pier Place South, Long Island City, $725,750. Electrical work, $387,852.

▲ N. Y., New York—HOUSING—New York City Housing Authority, 250 Park Ave., New York, 2 apartment houses, Harlem River Houses, Area 1a, 1 to 7 Ave. A, 129 St. to Harlem River, Area 1b, 1 to 7 Ave. A, 127 St. to 129 St., Area 1c, 1 Ave. A, 125 St. to 127 St., Zone 17, $2,745,990. Brook Ave., 156 St. to 157 St., Zone 17, $274,463. Area 1d, 1 Ave. A, 127 St. to 129 St., $290,750.

Pa., Bethlehem—HOSPITAL—Bids 6-29—Bethlehem Steel Co., Bethlehem, addition to Bethlehem Hospital Association, Fifth Ave. & Prospect St., $962,000.

▲ Pa., Monessen—HIGH SCHOOL—Bids 6-27—Monessen School District, Monessen, high school, Donora Rd., Finley Township, Washington County, $1,014,000.

Pa., Torrance—SCHOOL—Bids 6-27—Lawrence County School Directors, New Castle, 2 elementary schools, Mahoning Township, Lawrence County, $554,000.

Pa., Woodville—PATIENTS' Cottages—Bids 6-29—Commonwealth of Pennsylvania, Department of Property and Supplies, Harrisburg, 2 patients' cottages, Woodville State Hospital, Woodville, Henry Bruce, 320 Arbutus Dr., Pittsburgh, $532,877.

▲ Wis., Madison—LIBRARY—Contracts 6-29—University of Wisconsin, Madison, 2 story addition to Memorial Library, from Gust K. Newberg Constr. Co., 9 S. Clinton St., Chicago, Ill., $2,283,700. CD 5-16.

B. C., Vancouver—OFFICE—Province of British Columbia, Parliament Bldgs., Victoria, July 3, 2 and 3 story, 50x310 ft. office for Workmen's Compensation Bd., from Armstrong & Morreith Constr. Co., Ltd., 2149 Hornby St., $747,690. CD 6-16.

CONTRACTS AWARDED

Ala., Dothan—HOUSING—Dothan Housing Authority, Dothan, housing units for negroes, a John T. Clark, Greenville, Smith & Adams, Montgomery, $554,911. Bids 4-11. CD 6-8.

Ariz., Tucson—STUDENT UNION—State, University of Arizona, student union, Bldg. 69, Univ. Campus, from M. M. Sundt, 440 S. Park Ave., $898,827. Awarded ——.

▲ Calif., Los Angeles—SCHOOL—City Bd. Educ., 1425 S. Main St., Los Angeles, 2 story, steel frame, reinforced concrete and brick, Fairfax Ave. Jr. High School, 6300 Fairfax Ave., Los Angeles, $1,925,000. Bids 6-21, awarded 6-30. CD 5-26.

Conn., Putnam—SCHOOL—Town School Bldg. Comm., Dr. Burbour Clark, 2 story, brick and steel high school, 52 A. F. Peloso, Inc., 19 Lewis St., Hartford, $603,470. Bids 6-21. CD 7-6, under LB.

▲† Ill., Chicago—PLANT—U. S. General Services Admin., 433 W. Van Buren St., Zone 6, Indiana Avenue Federal Warehouse Annex, 2 story, brick and steel, reinforced concrete, for offices of U. S. Federal Agencies, to Gerhardt F. Meyne Co., 7 Dearborn St., Zone 3, $1,900,000.

Mass., Braintree—HOUSING—Town of Braintree Housing Authority, Town Hall, 100 veterans' housing units, Pearl Street Extension, from Mosher, Pearl & Snow, 1 Federal St., Boston, $894,150. Bids 6-20. CD 6-21.

Minn., Columbia Heights—SCHOOL—Bd. Educ., F. C. Jaskow, Jr., general contract 4 story, burnt, high school addition, alterations, from Stanford Street, Jct. 250 Builders Exchange Bldg., Minneapolis, $529,106. CD 6-22.

▲ Miss., Hattiesburg—HOSPITAL—Forrest Co. Hattiesburg, Miss., $1,048,831. CD 6-15.

▲† N. J., Fort Dix—QUARTERMASTER—Bldg. 1, Lancaster Ave., New York, N. Y., Quartermaster Depot, Fort Dix, Ave. Sea Breeze, $1,467,133. Bldg. 2, Ave. Sea Breeze, $1,467,133. Bldg. 3, Ave. Sea Breeze, $1,467,133. CD 6-22.

† N. M., Los Alamos—BUILDINGS—Atomic Energy Commission, Los Alamos Boundary, Zone 1, Los Alamos, N. M., Box 211, Albuquerque, $836,990. Bldg. 21, CD 6-21, under LB.

▲† N. M., Los Alamos—AARHUS—Atomic Energy Commission, Los Alamos Boundary, Zone 1, Los Alamos, N. M., Box 211, Albuquerque, $1,157,200. Bldg. 241, CD 6-21, under LB.

N. C., Kinnapolis—HIGH SCHOOL—Cabarrus Co. Bd. Educ., Kinnapolis, general contract high school, to Bunger Bros. Constr. Co., Mooresville, $545,300. Bids 6-20. CD 6-24, under LB.

Okla., Oklahoma City—MEDICAL SCHOOL—University of Oklahoma Medical School, Oklahoma City, Zone 4, University of Oklahoma, Norman, addition, 13 and Phillips Sts. to Charles M. Dunn Ave., 470 N. Hudson St., Zone 2, $769,870. Bldg. 115, $600,600. Bids 6-28. CD 6-27, under LB.

Pa., Bellefonte—HOSPITAL—Centre County Hospital, Bellefonte Hospital Association, addition, Mayer Bros., 260th Beaver Ave., Altoona, $698,000. Bids 6-16. CD 6-5.

▲Pa., Doylestown—HIGH SCHOOL—Central Bucks Joint High School Area, 1400 N. Delaware Ave., Philadelphia, to Clark & Co., 1500 Walnut St., Philadelphia, Zone 3, $1,631,000. Bids 6-23. CD 6-22, under LB.

Pa., Lancaster—HOUSING—Lancaster Housing Auth., 33 N. Duke St., Housing Proj., Hickory Tree, Hickory Tree Rd., S. E., Wards 440 N. Prince St., $842,118. Hales Associates, 2408 Walnut St., Harrisburg, engrs. CD 5-10.

Pa., Woodville—PATIENTS' Cottages—General State Authority, 18 and Herr Sts., Harrisburg, general contract, heating, piping and electric bids, Woodville State Hospital, Woodville, Henry Bruce, 320 Arbutus Dr., Pittsburgh, $532,877. Bids 6-29. CD 7-11.

▲ S. C., Greenville—HOSPITAL—Greenville General Hospital, Greenville, Thompson & Street Co., 430 Lindsay St., S. C., Atlanta, Ga., $2,755,800. Bids 6-16. CD 6-7, under LB.

S. D., Huron—AUDITORIUM-ARENA—Bd. Educ., Huron, $526,525. Bids 6-20. CD 6-21.

▲ Tex., Houston—POLICE STATION—City, Houston, $1,821,085. Bids 6-20. CD 6-21.

▲ Va., Petersburg—HOSPITAL—City Hospital, Petersburg, $2,272,000. Bids 6-22. CD 6-22, under LB.

Va., Powhatan—CELL—State of Virginia, Richmond, miscellaneous cell bldg. and connecting passage at State Prison Farm, to Department, Marquis & Flynn, Inc., 308 E. City St., Richmond, $631,147. CD 6-14, under LB.


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W. Va., Parkersburg—CHURCH—Ed. Tate, Asso. Co., Parkersburg, 2 story, bsmnt., 200x350 ft., brick, stone, Franklin Junior High School, South Parkersburg, to Southeastern Constr. Co., P. O. Box 722, Charleston. $587,624. Bids 6/23. CD 6/1.

▲‡ Alaska, Fort Richardson—HOUSES—U. S. Eng. (APO 942, c/o PM, Seattle, Wash.), Anchorage, thirty 8-family row-type houses, 595-567-90-19, to A. C. Dempsey Constr. Co. and S. Birch & Sons, 1912 4 Ave. S., Seattle, Wash., $3,175,000. Est. $3,276,962.—Bids 6/6. CD 6/15, under LD.

Ont., Deep River—HOUSING—Central Mortgage & Housing Corp., 395 Fleet St. W., Toronto, 25 houses, garages, sewer and water main extens. and roadways, Pres. Lot to T. R. Tremblay, 39 Laurbonn Ave., Ottawa. Approx. $650,000. CD 5/23.

▲ Ont., Rockcliffe—HOUSING—Central Mortgage & Housing Corp., 395 Fleet St., Toronto, 500 housing units, bsmnt. type, at R.C.A.F. Station, D.N.D., Northern Electric Co., Hull Clark Kramps, Ltd., Whitewood Ave., New Liskeard, about $2,250,000. Bids 2/4. CD 6/19, under Ont., Ottawa.

Ont., Toronto—HOSPITAL WING—Toronto Western Hospital, 347 Bathurst St., 6 story, bsmnt., 150x274 ft., reinforcement, steel, 200 bed hospital wing, to Eric Cumine Co., Ltd., 37 Yorkville Ave., approx. $867,000. Bids 6/27. CD 6/9.

## COMMERCIAL BUILDINGS

BIDS ASKED

Sask., Regina—CHURCH—B.A. 7-25—Portrait & Allbon, archts., Commerce Bank Bldg., church, for St. Andrews United Church Bd., Regina. Plans deposit $25.

Ark., Little Rock—BUILDING—B.A. 7-25—Immanuel Baptist Church, 10 and Bishop Sts., erecting facility, $400,000. Plans deposit $50. Bruce R. Anderson, Architect Bldg., Memphis, Tenn. CD 7-25.

Ga., Atlanta—CHAPEL, etc.—B.A. 7-25—Second Ponce De Leon Baptist Church, c/o Cooper, Bond & Cooper, archts., Henry Grady Bldg., chapel and educational bldg., CD 10-22-48.

Minn., Madison—HOME—B.A. 7-25—Lutheran Old People Home, Madison, 3 story ground floor, 91x146 ft., brick, stone, Old Peoples Home addn., $350,000. Long & Rapstad, 802 Wesley Temple Bldg., Minneapolis, archts. CD 12-23.

N. B., Moncton—THEATRE—B.A. 7-25—Kaplan & Sprachman, archts., 304 Dundas St. W., Toronto, Ont., 1,000 capacity theatre, for Richmond Theatres, Limited, Players Canadian Corp., 104 Bay St., Bank Bldg., Toronto, Ont. Approx. $275,000. H. Jasen, 1410 Bay St., Montreal, Que. engr. CD 12-27-44.

Fla., Miami—TOPS—B.A. 7-26—Richards Dpt. Store, c/o Steward & Skinner, archts., 223 S.E. First St., selected list bidders, dpt. store addn., alterations, CD 1-30.

Kan., Topeka—HOSPITAL—B.A. 7-26—St. Francis Hospital, Topeka, hospital addn., $409,000, R. A. Coolidge, 1349 High St., archt. CD 7-21.

Mo., Ladue (St. Louis, 24, P. O.)—CHURCH—B.A. 7-26—Annunziata Roman Catholic Church, Rev. Chancellor B. Faris, pastor, 921 Cella Rd., Zone 24, 1 story, bsmnt., 74x150 ft., Clayton and Cella Rds., Maguire & Link, 4908 Delmar Blvd., St. Louis, Zone 8, archts. CD 10-9.

La., New Orleans—HOSPITAL—B.A. 7-26—Charity Hospital of New Orleans, 1532 Tulane Ave., altering 3rd flr., Charity Hospital Neuro-Psychiatric Unit, Feret & Weil, 630 Gravier St., archts. CD 2-24.

Calif., San Francisco—HOSPITAL WING—B.A. 8-1—Children's Hospital, 3700 California St., 4 story, bsmnt., reinforced, structural steel hospital wing, remodeling, Hospital, Approx. $250,000. Skidmore, Owings & Merrill, 1 Montgomery St., archts., Isadore Thompson, 583 Market St., engrs. CD 8-24-49.

Ill., River Forest—APARTMENTS—Bids Asked—Martin H. Braun, 2130 Garfield St., Oak Park, twelve 2 story, bsmnt. 48 unit apartments, $360,000.

N. Y., Brooklyn—CHURCH—Bids Asked—St. Ephrems Roman Catholic Church, 2415 Fort Hamilton Parkway, church, 2411-23 Fort Hamilton Parkway, Emmons, Paul C. Reilly, 111 Fifth Ave., New York, Zone 3, archt. CD 5/4.

SOON LETS CONTRACT

▲ Ill., Chicago—APARTMENT—University of Chicago, 5801 S. Ellis St., Zone 37, soon lets contract, 229 unit brick, resi.-type apartment for faculty housing, $2,500,000. Pietro Belluschi, 157 E. Erie St., Zone 11, archt. CD 4-28.

▲ N. Y., Patchogue—HIGH SCHOOL—Seton Hall Catholic High School, S. Ocean Ave., soon lets contract, high school, Rue Blvd. and Patchogue Lake, $2,500,000. CD 3/16-49.

LOW BIDDERS

Tex., Dallas—HOSPITAL—St. Pauls Hospital, 5121 Bryan St., Zone 28, general, district 6 story bsmnt., hospital and alterations, etc., from R. E. McKee, Inc., P. O. Box 2858, $873,220. CD 6-28.

▲ Vt., Burlington—HOSPITAL—Mary Fletcher Hospital, Burlington, Zone 27, hospital addn. from Vermont Structural, Inc., 100 St. 42 St., New York, N. Y., $1,724,000. Wilkins, Mead & White, 101 Park Ave., New York, N. Y., archts. CD 6-23, under LD.

CONTRACTS AWARDED

Calif., Bellflower—DWELLING—Ryless Constr. Co., 5601 E. Randolph St., 113 stucco dwellings, Home and Pepperwood Aves., Maplewide, Hargill and Dilberg Sts., Owner builds, $700,000.

▲ Calif., Burlingame—HOTEL, etc.—R. P. Etienne, 514 Ave., San Mateo, 2 and 3 story, 128 room hotel with swimm. pool, to W. C. Ritt Co., 46 Market St., San Francisco, Approx. $1,000,000. Frank W. Green, 1515 Chevy Chase Dr., Glendale, archt.

Calif., Downey—DWELLINGS—Ajax Constr. Co., 3221 Independence Ave., South Gate, 131 dwellings in tract 16390, Owner builds, $851,500. Caldwell & Mason, 2155 Pacific Ave., Long Beach, archts.

Calif., East Los Angeles—DWELLINGS—Janan Homes, Inc., 9434 Long Beach Blvd., South Gate, 112 stucco dwellings, Wescott, Rascommon, Blackwood, Wemos, Vanpower and Broxson Aves., to Biltmore Homes, Inc., 9434 Long Beach Blvd., South Gate, $828,040. Hugh Gibbs, 441 E. 1 St., Long Beach, archt.

Calif., Lodi—HOSPITAL—Lodi Memorial Hospital Assn., 200 W. Pine St., 3 story, bsmnt., penthouse, 70-bed extension, hospital to Moore & Roberts, 643 Mission St., San Francisco, $545,655. Bids 6/20. CD 6/7.

Calif., Redwood City—RESIDENCES—Eichler Homes, Redwood City, 64 residences in Alderwood Subdivision, Charles Butler, $576,000.

▲ Conn., Fairfield—HOUSES—Stratfield Hills Development, c/o contractor, 107 frame range type houses, Dodd and Mowbray Constr. Co., Inc., Davis Rd., Approx. $1,000,000.

D. C., Wash.—APARTMENT—Holly House, Inc., 6980 Maple St. N.W., 8 story, 4x100 ft., 60 unit reinforced concrete curtain wall apartment, 1925 F St. N.W., to Abbitt Constr. Co., 1925 F St. N.W., Approx. $500,000. Milton J. Prasser, 1737 Hobart St. N.W., archt. and engr.

▲ Ill., Chicago—HOSPITAL RESEARCH LABORATORY—Mount Sinai Hospital, 2751 W. 15 St., Zone 8, 11 story, bsmnt., concrete, brick hospital research laboratory, to Purcell Constr. Co., 2001 W. Pershing St., Zone 9, $2,881,600. Awarded 7/6. A. Epstein & Sons, Inc., 2011 W. Pershing St., Zone 9, archts.

▲ Ill., Chicago—OFFICE—Remington—Rand Inc., Michigan and Grand Aves., Zone 11, 4 story steel, concrete, brick office and showroom, to J. E. Greiner Co., 1006 N. Charles St., Zone 1, $1,400,000. Awarded 6/3. CD 6-29.

Ill., Matteson—RESIDENCES—Jos. W. O'Connor, 10459 Western St., Zone 43, one story, brick residences, Main at 211 St., Owner builds, $800,000. Awarded 6/30. Tress Cunningham, 7543 N. Western Ave., Chicago, Zone 45, archt.

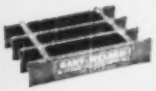
La., New Orleans—HOMES—Andrew Carter, c/o contractor, 100 homes, to Bob Bros. Constr. Co., 2400 Cypress St., Approx. $600,000.


GARY
Welded Grating
with Hexagonal Cross Bars

• This one-piece grating features design, construction, and appearance. The main bearing bars and the hexagonal cross bars are welded, insuring a durable unit. Our method of manufacture results in the tops of all bars being flush.

This particular design of welded grating is made with the main bars on 1.3 16" centers or .915 centers and the cross bars on 4" centers in panels 24" or 36" wide, and lengths to 36' 0".

Special gratings can be furnished with cross bars spaced on 1½" 2" 2½" or 3" centers.



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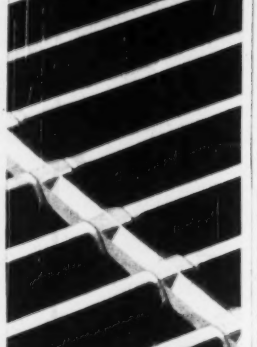

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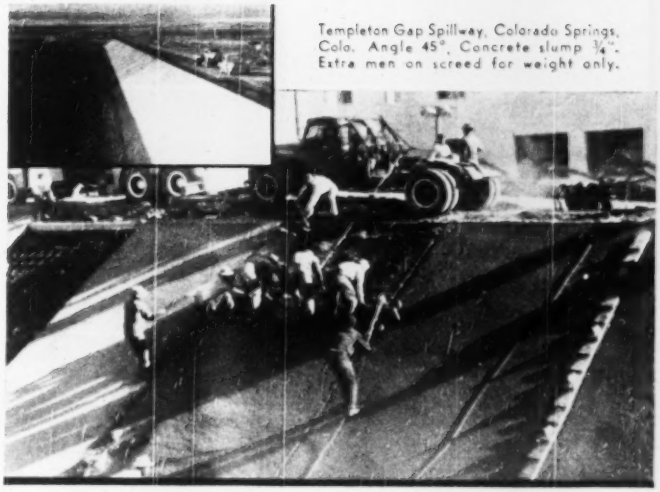

Templeton Gap Spillway, Colorado Springs, Colo. Angle 45°. Concrete slump ¾". Extra men on screed for weight only.

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**GREATEST PRODUCER OF QUALITY WORK ON:**

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**BRIDGE DECKS**

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**HIGHWAY PATCHING and WIDENING**

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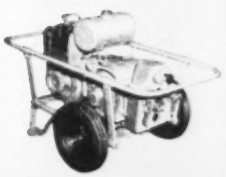
Powered by a thoroughly reliable Jackson 1.25 KVA Portable Power Plant, this manually guided screed will place perfectly upwards of 65 cu. yds. of stiff mix concrete per hour; will undercut at side forms and curbs; strike off to crown (regular or inverted); work right up to and around sewers, manholes and other obstructions. Has strong tendency to propel itself and operators can easily and quickly roll it back for second passes ***without bearing the weight of the screed.*** Operators work from front, rear or side of machine. Quickly adaptable to any slab width from 6' up to any practical width. You're missing a tremendous time-and-money-saver if you are not familiar with the Jackson Screed. Write for details or see it at your Jackson distributor.



Model M-1 Power Plant — operates the screed. Generates both single and 3-phase 60 cycle, 115 volt AC. Equipped with generator requiring no maintenance or adjustment. May also be used for lights or operating tools. Other plants of 2.5 and 5 KVA capacities.

**OTHER MONEY-MAKING VIBRATORY EQUIPMENT** for all types of concrete construction from thin sections to mass construction, highway and airport paving. FOR SALE OR RENT at your Jackson Distributor. Write for handy Jackson "Pocket Guide" to the complete line.

**ELECTRIC TAMPER & EQUIPMENT CO. Ludington, Mich.**

Pa., Phila.—HOSPITAL—Phila. Psychiatric Hospital, Ford and Monument Rds., hospital, to Mariner Masonic Constr. Co., 2619 W. Thompson St., $609,750. BIDS 2/20. CD 4-8.

Pa., Phila.—APARTMENT—Stenton Apartments, Inc., 2350 York Rd., Melrose, apartment, owner, St., separate contracts, $500,000. J. Gross Feinberg, 1225 Walnut St., Phila., archt.

Pa., Pittsburgh—SEMINARY—Greek Catholic Church, 6-8 S. J. Hergesheimer, archt., Century Bldg., 3-story, limestone seminary, to Brosca Bros., 229 Fairway Way, $600,000.

Pa., Pottstown—RESIDENTIAL DEVELOPMENT—Anthony L. Veach & Earl M. Kaercher, 24 N. Evans St., Pottstown, Development, Hills Blvd., separate contracts, $500,000.

▲ Tenn., Kingsport—HOSPITAL—Holston Valley Hospital Auth., contractor selection to Gantt-Constr. Co., Johnston Bldg., Charlotte, N. C., $1,503,000. CD 6-27, under LB.

Tex., Dallas—APARTMENT—Dorchester House, 9707 Garland Rd., 12-story, 151-unit apartment to Hall H. Tompkins, 927 Fox St. N.W., owner, Q. Ed. Smith, $750,000.

▲ Tex., Dallas—APARTMENT—H. Lavine Hall, 4353 E. Lovers Lane, 11 apartments, owner, Lavine, Approx. $1,350,000. CD 6/5.

▲ Tex., Fort Worth—HOUSING—Carroll Park Apartments, Carroll Blvd. (opens prec. 22nd Ave., 181 units housing of St. Squares, 32 duplexes, and four 4-family units, McLart and Bell St., to Bob Brennan, Inc., 3811 Simpson Pl., Dallas, $1,000,000. Charles E. Armstrong, 351 Majestic Bldg., archts.

Tex., Houston—DWELLING—Mrs. Irene Zaiss, Pease St., 2-story dwelling, concrete slab, Owner bullds., $760,000. CD 5-25.

Tex., Houston—DWELLING—Dryden Corp., 6-8 Mark Cromwell, First National Bank Bldg., 29 frame dwellings, owner builds, $575,000. CD 6-19.

Tex., Houston—APARTMENT—Lewis Gulley Co., W. 27th St., 240-unit "Negro" apartment, Walter Hoffman, $985,000. CD 6-23.

Tex., Houston—DWELLING—South Park Development Co., 6000 Holmes Rd., 100 dwelling units, each, $625,000. CD 6-23.

Tex., Houston—DWELLINGS—Miles Homes, Southern National Bank Bldg., 65 dwellings, owner builds, $500,000. CD 6-23.

Tex., Houston—DWELLINGS—A. J. Bonnie & Associates, 5622 Long St., 24 dwellings, owner builds, 5622 Long St., Owner builds, $575,000. CD 6-16.

Tex., Houston—DWELLINGS—Dow J. Zanolini & Associates, 6000 Dartmouth, adjacent Industrial area, West Bldg., 30 dwellings, owner builds, Approx. $611,000. CD 11-24.

Tex., Pasadena—DWELLINGS—Foreman-Hall Tatum, Southern National Bank Bldg., 45 dwellings, owner builds, $975,000. CD 6-16.

Va., Norfolk—HOMES—John G. Phillips, 111 Lucille Ave., 40 homes, owner builds, $600,000.

Wash., Yakima—HOTEL—Yakima Community Hotel Inc., Yakima, general contractor, Albert W. Wilson & Sons, Yakima, $612,328. CD 6-27.

Wash., Yakima—HOTEL—Yakima Community Hotel Inc., Yakima, general contractor, Albert W. Wilson & Sons, Yakima, $612,328. CD 6-27.

Wis., Milwaukee—APARTMENT—Mrs. Ruth Ann Hoffman, 3000 Lake Dr., 3-story, 12-unit apartment, owner builds, $319,083. CD 6-23.

Col., Copper City—[illegible] Approx. $700,000. CD 6-16-47.

Ont., Crenshton—DWELLINGS—[illegible] Approx. $600,000.

▲ Ont., New Toronto—APARTMENT—[illegible] Lake Shore Rd., two-story apartments, Lake Shore Rd., Approx. $1,250,000.

Ont., Toronto—MINARY—[illegible] Ltd., 1320 Bay St., Approx. $500,000. CD 6-14.

## INDUSTRIAL BUILDINGS

BIDS ASKED

Ga., Atlanta—WAREHOUSE—[illegible] Motor Co., 1 Georgia Ave., 3-story, [illegible] Ave., Approx. $1,000,000.

Ga., Eastman—WAREHOUSE—[illegible] Electric Membership Corp., 1-story, [illegible] Extended, to Dublin Ave. N.E., Atlanta, engr. CD 6-27.

Ill., Chicago—FACTORY—Bids Asked Monday, 6-26, N. Crawford to Pine St., Factory, $350,000. Alfred S. Alschuler & Assoc., archts., 79 W. Monroe St., Zone 12, archts.

Pa., Phila.—PLANT—Bids Asked—Structural Welding Machine Co., 1-story, Approx. $60,000. Joseph Margolis, 2206 S. 22nd St., archt.

Pa., Phila.—TRUCK TERMINAL—Bids Asked—Rex & Co., 1805 N. 5 St., truck terminal, Approx. $60,000.

Tex., Bryan—WAREHOUSE—Bids Asked—Schumacher Co., Bryan, warehouse, $125,000. Wm. E. Nash, City National Bank Bldg., archt. CD 6/27.

SOON LETS CONTRACT

▲ Ind., Jeffersonville—WAREHOUSE—Palmolive Peet Co., Jeffersonville, warehouse, etc., contract concrete slab, Brick Masonry, $1,500,000. Albert H. Kahn Associated Architects & Engineers, Inc., New Center Bldg., Detroit, Mich., archts.

▲ N. S., Louisburg—PLANT—W. R. Wood, 2412 Crescent St., Montreal, Que., soon lets contract reinforced concrete steel for processing plant, Louisburg, Nova Scotia, Canada, to Louisburg Fisheries Ltd., Louisburg.

CONTRACTS AWARDED

Ill., Chicago—WAREHOUSE—[illegible] 4444 W. 47 St., Zone 32, 100,000 sq. ft. one-story brick, concrete warehouse, to [illegible] Corp., 1 W. Grand Ave., Zone 10, $500,000. Bids 6-23. CD 6-27.

Ill., Evanston—PLANT—[illegible] Gas & Coke Service Co., 1-story, [illegible] Bldg., Photographic Bldg., to Bovis & Andrews, 2300 Chicago Ave., Zone 12, $350,000. CD 6-23.

Ill., Northbrook—[illegible] Co., Zenith Electronics Corp., Skokie Rd., 1-story, [illegible] factory and office, to Wunder & Son, 37 W. Van Buren St., Chicago, Approx. $360,000. Bids 6-27. CD 6-23.

▲ Ky., Greensburg—PLANT—Tennessee Gas Transmission Co., Houston, Tex., [illegible] Bldg., Houston, Tex., design and construction plant for extraction and recovery of [illegible] hydrocarbons from natural gas, Greensburg, New York, N. S. Webster Eng. Corp., 2 Rector St., New York, N. Y., $12,000,000. CD 6-23.

Neb., Lincoln—PUBLISHING PLANT—State Journal, 903 P St., [illegible] Co., 1-story, $750,000.

▲ N. C., Wilmington—FABRIC PLANT—Wrightsville Fabric Mills, Inc., [illegible] fabric plant, to Mikko Inc., Wrightsville, $3,500,000. Bids 6-22. CD 6-13.

▲ O., Dayton—[illegible] Co., [illegible] warehouse, [illegible] Bldg., [illegible] Bldg., to Austin Co., Cleveland, $12,000,000. CD 6-23.

Pa., Bethlehem—PLANT—American Petroleum Gas Co., 212 Hamilton St., Cylinder [illegible] Catalytic [illegible] Co., 1401 Arch St., Phila., $850,000.

▲ S. C., Belton—MILL—Riverside Manufacturing Co., Anderson, [illegible] to-Date Co., 424 W. Main St., Greenville, Approx. $2,000,000. CD 6-2 under LB.

B. C., Kimberley—[illegible] Ltd., Trail, B. C., $500,000. CD 6-24-46.

## UNCLASSIFIED

BIDS ASKED

New York—[illegible] Approx. $35,000.

North Carolina—RURAL DISTRIBUTION LINES—B.A. [illegible] Co., [illegible] Memphis, Tenn., Warren, [illegible] Co., [illegible] Co., [illegible] Co.,

# OFFICIAL PROPOSAL

### Electrical Work

THE BOARD OF EDUCATION OF CENTRAL SCHOOL DISTRICT No. 1 TOWNS OF TUSTEN AND CONCORD SULLIVAN COUNTY, NEW YORK (OWNER)

Sealed bids for Electrical Work for the Alterations and Addition to the Narrowsburg Central School, Narrowsburg, New York will be received by the Board of Education of Central School District No. 1 Towns of Tusten and Cochecton, Sullivan County, New York at the office of the Board of Education of the School Treasurer at Narrowsburg, New York until 2:00 P.M. Eastern daylight saving time, August 8, 1950, and then at said place publicly opened and read aloud.

The Information for Bidders, Form of Bid, Form of Contract, Plans, Specifications, and Forms of Bid Bond and Performance Bond may be examined at the office of the Architects, Ketchum, Konkel, Barrett, Nyquist & Tallamy, 155 Washington Ave., Albany, N.Y. and copies thereof obtained at said Architects' office upon payment of $20.00 for each set. A bidder must submit a deposit of $10.00 for each set of plans and specifications which will be refunded upon payment and cancellation upon returning each set which is furnished to him.

The Board of Education reserves the right to waive any irregularities or to reject any or all bids.

Each bidder must deposit with his bid security in the amount of not less than five percent (5%) of the base bid in the form and subject to the conditions provided in the Information for Bidders.

Attention of bidders is particularly called to the requirements as to conformity to State Labor Law to be met under the contract.

No bidder may withdraw his bid within forty-five (45) days after the actual date of the opening thereof.

CHARLES J. MAAS
President, Board of Education

Date: August 2, 1950. (4576)

### Removal of Filter Material, etc.

Notice is hereby given that sealed bids will be received by the Mayor and Council of the Borough of Wanaque in the County of Passaic for the Removing of Existing Filter Material and Replacing with New Material to the Filters in the Borough of Wanaque, Passaic County, New Jersey, and opened and read in public at the Municipal Building, Wanaque, New Jersey on Wed., Aug. 2, 1950 at 8 P.M. Prevailing Time.

Drawings, specifications and form of bid, contract and bond for the proposed work prepared by Caldwell & Link, Registered Engineers, of Caldwell, New Jersey and Clifton, are on file in the office of said Engineers at 200 Clifton Ave., Pompton Lakes, N.J. and may be inspected by prospective bidders during business hours. Bidders will be furnished with copies of the specifications and drawings on proper notice. Bids must be made on the standard proposal form of the Borough of Wanaque, Passaic County, New Jersey and must be accompanied by a certified check, cash or bid bond in the amount of 10% of the bid. The successful bidder will be required to enter into a contract and give bond for the faithful performance of the contract in the amount of 100% of the bid. Bonds must be executed by a surety company authorized to do business in the State of New Jersey. The bidder must be licensed by the State of New Jersey and must be prepared to present evidence of such licensing before the bid will be considered. Bidders will be furnished with copies of the specifications and drawings on proper notice. Bids must be made on the standard proposal form of the Borough of Wanaque, Passaic County, New Jersey and must be accompanied by a certified check, cash or bid bond in the amount of 10% of the bid. The successful bidder will be required to enter into a contract and give bond for the faithful performance of the contract in the amount of 100% of the bid. Bonds must be executed by a surety company authorized to do business in the State of New Jersey. The bidder must be licensed by the State of New Jersey and must be prepared to present evidence of such licensing before the bid will be considered. The Mayor & Council reserve the right to reject any or all bids or to waive any informalities therein.

ANTHONY W. GUIDA
Mayor

ATTEST: ANNA L. HAGGERTY
Clerk

Date: August 2, 1950. (4577)

### Sewage Treatment Plant
### Laconia, New Hampshire

Sealed bids for construction of Sewage Treatment Plant will be received at office of City Hall, Laconia, New Hampshire, until 2:00 p.m. Eastern Daylight Saving Time, August 15, 1950.

Drawings and contract documents may be examined at various offices and obtained at Lawrence & Edes, Engineers, 100 State Street, Boston, Mass., $10.00 deposit.

Project includes buildings 36 ft. by 45 ft. by 2 stories 22 ft. by 40 ft. by 2 stories, and 16 ft. by 16 ft. by 1 story; 1 Chlorination Tanks 10 ft. long, 2 Sedimentation Tanks 10 ft. diameter by 7 ft. deep, 2 Digestion Tanks 25 ft. diameter by 21 ft. deep, 2 Sludge Covered Sludge Beds each 70 ft. by 12 ft., pipe, equipment and appurtenant work.

Bid security, certified check or bid bond in the amount of ten (10) percent of total bid. Surety on bid bond must be authorized to perform bond.

Public Works labor law and wage scale apply.

CITY OF LACONIA, NEW HAMPSHIRE
By Alfred J. DeMara
Mayor
Attest:
City Clerk
Superintendent of Streets

### U. S. Government

UNITED STATES DEPARTMENT OF THE INTERIOR Bureau of Reclamation, Sealed bids (Specification No. 4726) will be received at Bureau of Reclamation Regional Office, Room 1006, Federal Building, Denver, Colorado, until 10:00 a.m. Mountain Standard Time, August 8, 1950, and then publicly opened and read for furnishing labor and materials and performing all work for the construction of Access Roads, Transmission Line, Substation, and Appurtenant Work, Fremont Canyon Powerplant Unit, Missouri River Basin Project, Wyoming. Work includes about 2 miles of access roads, about 220 miles of transmission line, about 2 miles of electrical conductor, conductor strain, and equipment and other work. Time allowed for completion will be 240 days. Bid documents may be obtained from the Bureau of Reclamation, Regional Director, Room 1006, Federal Building, Denver, Colorado, upon deposit of $10.00, which will be refunded upon return of documents in good condition within 10 days after opening of bids. For particulars address Bureau of Reclamation, Regional Director, Room 1006, Federal Building, Denver, Colorado.

MICHAEL W. STRAUS, Commissioner.

(4578)

UNITED STATES DEPARTMENT OF THE INTERIOR Bureau of Reclamation, Sealed bids (Specification No. 4726) will be received Bureau of Reclamation Regional Office, Room 1006, Federal Building, Denver, Colorado, until 10:00 a.m. Mountain Standard Time, August 8, 1950, and then publicly opened and read for furnishing labor and materials and performing all work for the construction of the Beaver Creek substation, Colorado-Big Thompson Project, Colorado. The work is situated 2 miles east of Brush, Colorado. Principal items of work involve furnishing and erecting prefabricated building, 24 ft. by 40 ft. by 16 ft. steel structure; trenching and installing 2 cm. (6 in. diameter) transite conduit and piping, installing 22 mm. (No. 4/0 A.W.G.) copper electrical equipment and other work. Time allowed for completion will be 270 days. For particulars address Bureau of Reclamation, Regional Director, Room 1006, Federal Building, Denver, Colorado, or U.S. Reclamation Service, Post Office Building, Brush, Colorado.

MICHAEL W. STRAUS, Commissioner.

(4579)

NEW ORLEANS DISTRICT, CORPS OF ENGINEERS, Post Office Building, New Orleans, La. Sealed bid will be received until 12:00 noon, C.S.T., August 15, 1950, and then opened for the construction of approximately 6 miles of levee and appurtenant structures in the New Orleans District. The principal features included are: approximately 30,000 cubic yards of concrete; 70,000 cubic yards of reinforced concrete; 30,000 cubic yards of prestressed concrete; 1,000 cubic yards of structural steel; and 1,000 cubic yards of miscellaneous metal. Bidding documents may be obtained from the District Engineer, New Orleans District, Corps of Engineers, Post Office Building, New Orleans, La., upon deposit of $10.00 for each set. Deposit will be refunded upon return of documents in good condition within 10 days after opening of bids. For further information address the District Engineer, New Orleans District, Corps of Engineers, Post Office Building, New Orleans, La.

(4580)

Continued on page 98

OFFICIAL PROPOSALS
(Continued from page 97)

Bids: July 26, 1950 (872)

## State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of the Highway Law, sealed proposals will be received until ten-thirty o'clock A.M. advanced standard time, which is nine-thirty o'clock A.M., eastern standard time, on Wednesday, July 26, 1950 by Henry A. Coburn, Director, Bureau of Contracts & Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following project: Maps, plans, specifications, and proposal forms may be seen and obtained at the office of the State Department of Public Works Bureau of Contracts & Accounts, Albany, N. Y., and at the office of the District Engineers noted below, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

| County | Contract No. | Name of Road | Miles | Type | Deposit | Estimated Cost of Work |
|---|---|---|---|---|---|---|
| | | DISTRICT No. 2 | | | | |
| | | L. Kerrow, Dist. Engr., 109 No. Goodman St., Roch., N.Y. | | | | |
| Fulton | RC 50-34 | Maryhill Village S. H. 5104 | 1.00 | Asp. Conc. Typ. IA 4in. | $2,000 Plans $10 | $122,000 |
| | | Maryhill-Northville, Ft. I. S. H. 863 | | | | |
| | | DISTRICT No. 10 | | | | |
| | | J. J. Darcy, Dist. Engr., Montauk Hwy. at Little J. Neck Rd., Babylon, L.I., N.Y. | | | | |
| Kings | BQE 50-3 | Brooklyn-Queens Expressway | 1.00 | Directional Sign | $ 500 Plans $10 | $43,000 |
| | | west of 4th Ave. | | | | |
| Queens | CWE 50-4 | Van Wyck Expressway, Exit 3 to 16 | 3.40 | Directional Signs | $2,400 Plans $10 | $40,000 |
| Suffolk | RC 50-35 | Amityville Village Bypass, Broadway S. H. 1603 | 0.65 | Asp. Conc. Typ. IA 9in. | $7,000 Plans $10 | $132,000 |
| | | Amityville Village S. H. 1603 | 0.48 | Mod. Wear. 6in. | | |

Proposals for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly indorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of "State of New York, Comptroller of Taxation & Finance" for the sum as specified in the advertisement and the proposal.

The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law, as set forth in "Instructions to Bidders."

The right is reserved to reject any or all bids.

H. D. TALLAMY,
Supt. of Public Works.

Bids: August 2, 1950 (877)

## State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of the Highway Law, and special provisions for projects financed with federal aid funds, sealed proposals will be received until ten-thirty o'clock A.M., advanced standard time, which is nine-thirty o'clock A.M., eastern standard time, on the 2nd day of August, 1950, by Henry A. Coburn, Director, Bureau of Contracts & Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the Construction of the following project in Herkimer County.

| County | Name of Road | Length | Type | Deposit | Estimated Cost of Work |
|---|---|---|---|---|---|
| Herkimer | Highland-Ilion-Frankfort | | | | |
| No. | Type | | | | |
| FAS Assn. cons. | Prospect-Herkimer-Ilion | | | | |
| 28 apt. | Co. Line, Pl. | | | | |
| 30 9 | 2 Ouaka Co. | | | | |
| | Lansingburgh | | | | |
| | 3000 cubic | | | $50 | $70,000 |

Maps, plans, specifications, and estimates may be obtained at the office of the Department of Public Works, Bureau of Contracts and Accounts, Albany, N. Y., and at the office of the District Engineer, Lawrence Kelly, 109 Goodman St., Rochester, N. Y., and may be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for Plans and Proposal Forms for each contract is indicated. A refund will be made in full to bidders for return of the plans in good condition, within 30 days of award or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

Special attention of bidders is called to "Federal Information for Bidders" in the proposal, specification, and contract agreement, and to the special provisions applying to projects financed with federal funds.

Proposals for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly indorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of "State of New York, Comptroller of Taxation & Finance" for the sum as specified in the advertisement and the proposal.

The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law, as set forth in "Instructions to Bidders."

When optional types are permitted on contracts with federal funds, bidders must state in the space provided in the proposal the exact designation of the optional type upon which the proposal is predicated.

The right is reserved to reject any or all bids.

H. D. TALLAMY,
Supt. of Public Works.

OFFICIAL PROPOSALS

Bids: Aug. 10, 1950 (860)

## Housing Project

HOUSING
PROJECT NO. PR-2-S-1
San Juan, Puerto Rico

The Municipal Housing Authority of the Capital of Puerto Rico will receive sealed bids until 2:00 P. M., on the 10th day of August, 1950, at their office in "Caserio San Antonio", Avenida Fernandez Juncos, Puerta de Tierra, Puerto Rico, at which time and place all bids will be publicly opened and read aloud, for the construction of the following housing projects located on the side of Avenida Fernandez Juncos, Loiza Street, Bonair Road No. 21, Santurce, Puerto Rico.

PROJECT P.R.-2-S-1

882 dwelling units in forty-nine (49) reinforced concrete apartment buildings, including utilities and site improvement all in accordance with the Contract Documents.

The successful bidder will be required to furnish satisfactory performance and payment bond or bonds.

Attention is called to the fact that not less than the minimum wage rates as set forth in the Contract Documents must be paid on this project, and that all wages must comply with the minimum wage laws now in effect in Puerto Rico or with the changes which may occur during the life of the contract without increase in the contract price.

Proposal forms, Contract Documents, including Plans and Specifications, are on file at the office of the Municipal Housing Authority of the Capital of Puerto Rico.

Copies of the Contract Documents may be obtained by depositing certified check for one hundred and fifty dollars ($150.00) with the Municipal Housing Authority of the Capital of Puerto Rico for each set of the Contract Documents obtained. The deposit will be refunded to each person who submits a bona fide proposal and to each bidder who returns the Contract Documents in good condition within ten days after the opening of the bids.

The Municipal Housing Authority of the Capital of Puerto Rico reserves the right to reject any or all bids and to waive any informalities in bidding.

A certified check or bank draft payable to the Municipal Housing Authority of the Capital of Puerto Rico, a Government Bond or a satisfactory bid bond executed by the bidder and a surety company in an amount equal to five per cent (5%) of the bid shall be submitted with each bid.

No bid shall be withdrawn for a period of sixty (60) days subsequent to the opening of bids without the consent of the Municipal Housing Authority of the Capital of Puerto Rico.

MUNICIPALITY HOUSING AUTHORITY OF THE CAPITAL OF PUERTO RICO,
C. L. STAUSELL,
Executive Director.

OFFICIAL PROPOSALS

Bids: August 1, 1950 (869)

## Facilities to Existing Waterworks

Sealed bids will be received by the City Clerk of Willimantic, Connecticut at the office of the City Clerk, Room 5, City Hall until 1:00 P.M. Daylight Saving Time, August 1, 1950 for the construction of Contract No. 1 of Additional Facilities to Existing Waterworks, comprising New Prestressed Concrete Standpipe and Improvements to Existing Reservoir for the City of Willimantic, Connecticut, at which time they will be publicly opened and read.

Each bid shall be in accordance with the requirements of the Contract Documents which are available for examination or purchase at the office of the City Clerk, Willimantic, Connecticut or of Gibbs & Hill, Inc., Consulting Engineers, Pennsylvania Station, New York 1, New York. Copies may be purchased upon deposit of $20.00 per set, which deposit will be refunded to each actual bidder, and one-half of the deposit to non-bidders, upon return of such copies in good condition within 5 days after the bids are opened.

The City of Willimantic reserves the right to reject any or all bids and to waive any informality in bids received.

Dated at Willimantic, Connecticut, this this 10th day of July, 1950.

ROGER F. FAULHUS,
City Clerk.

U. S. Government

UNITED STATES DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids Specifications No. 7221 will be received by Bureau of Reclamation, Denver, Colorado, August 8, 1950, and then publicly opened for furnishing four 6-foot by 7-foot 6-inch high-pressure gates with four 12,000-pound hydraulic hoists, two 15,000-pound semiautomatic gate hangers, and 2 hydraulic gate hangers with part for mechanical indicators for Trenton Dam, Missouri River Basin Project, Nebraska. Delivery is desired within 180 days. For particulars, address Bureau of Reclamation, Building 1-A, Denver Federal Center, Denver, Colorado.

MICHAEL W. STRAUS, Commissioner.
(871)

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Write giving age, education, marital status, and detailed experience resume.

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Radio City Station
New York 19, New York

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CITY OF DETROIT

Detroit Civil Service Commission
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735 Randolph Street, Detroit 26, Mich.

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P-216, Engineering News-Record
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P-6606, Engineering News-Record
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(Continued on page 100)

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P-2108, Engineering News-Record
330 W. 42nd St., New York 18, N.Y.

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P-7151, Engineering News-Record
330 N. Michigan Ave., Chicago 11, Ill.

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(Continued from page 98)

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Universal truck crane.

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Buf-Spring 5 to 7 tons, Tandem.
B-S tandem 3 axle 10-14 tons.
Hercules 1 wheel 10 tons.

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2 Yd 56-S Smith Mod T Tilting Mixer.
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1—2 Yd Smith Hi-Discharge Transit Mixer. Mtd.
3 Jaeger 2½ Yd Hi-Discharge Transit Mixers. New 1949. Mtd on Mack Mod ESQW Trucks.
Cat. Model 112 Motor Grader.
Austin-Western Model 99-M Auto-Patrol Diesel.
Koehring Model 14-E Twin Batch Paver.
Ransome 34-E Dual Drum Paver. Diesel Power.
2 Jaeger 5 yd. Transit Mixer, unmounted.

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Butler cement bin 105 bbls. Complete.
Aggregate bin 105 tons 3 compts. No batcher.
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Masden 3000# cap. Complete.
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1 Euclid Model 49-FD rear dump.
6 Euclid Model 27FD Rear Dump.
4 Cat. DW10 Tractors Athey PD10 trailers.
3 Athey FB; two EB 2 way dump wagons.

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REX 160-180-190-200 with fittings.

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Marion Mod 111 M Diesel Hi Lift Shovel.
Marion Mod 962 1½ Yd. Shovel, Crane, Dragline.
Koehring 605 Diesel Crane ½ yd. 100' bm.
Koehring 404 Diesel ¾ Yd Shovel, Crane, Backhoe.
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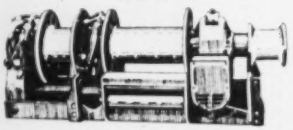

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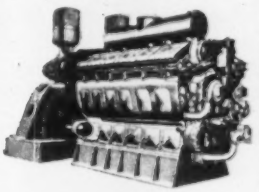
VARIOUS VOLTAGE



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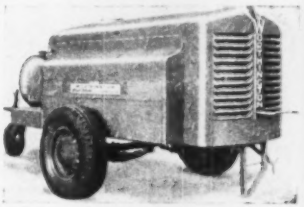

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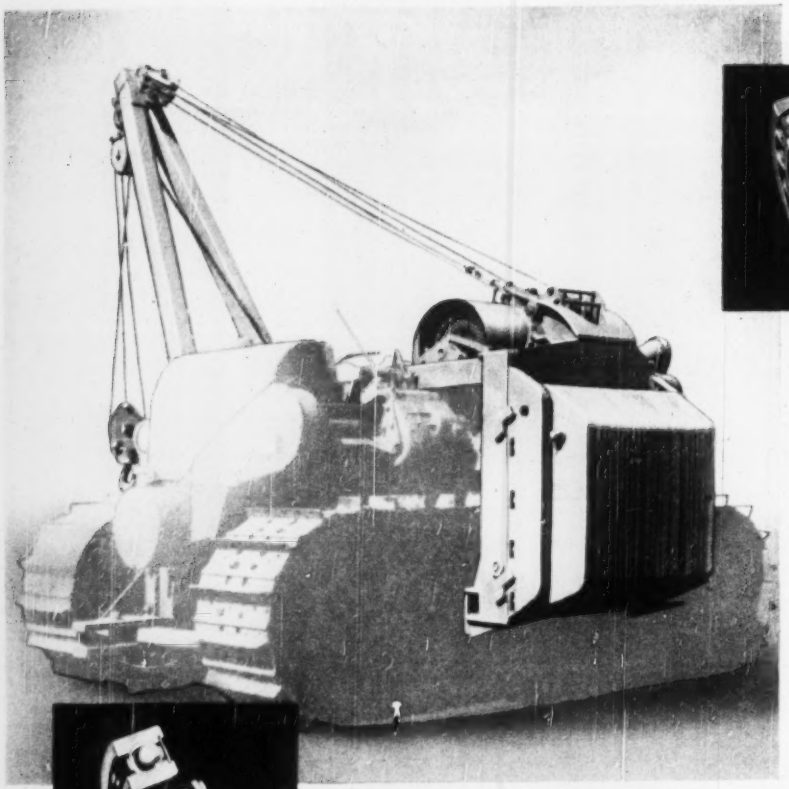

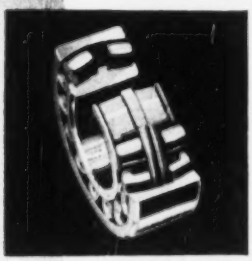

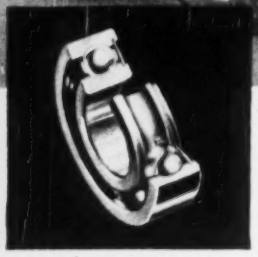

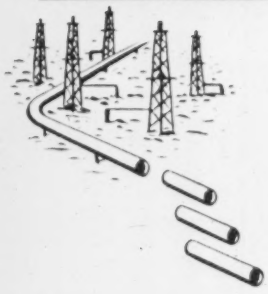

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As manufactured by the Superior Equipment Company, Bucyrus, Ohio, Superior Pipe Booms are flexing their muscles in oil fields and major construction projects the country over. They're doing a mighty tough job . . . and they're doing it mighty well and economically. Much of their smooth-running efficiency is due to the types of bearings used . . . SKF Bearings that keep friction at the minimum. Two SKF Spherical Roller Bearings are used on the winding drums with a Double Row Deep Groove Ball Bearing on the drive shaft. SKF Single Row Deep Groove Ball Bearings are used on the power take-off. SKF's ability to contribute to the efficiency of heavy-duty machines is the natural result of SKF's rigid manufacturing controls . . . strict inspection . . . continuing research and development. Let SKF Engineers help you design for greater capacity . . . greater operating economy.

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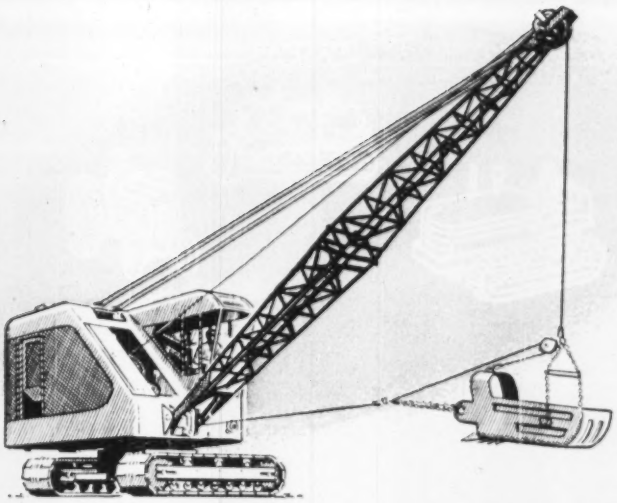

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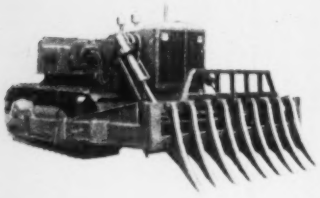
# NEW PRODUCTS

## Trencher's Conveyor Operates Independently of Digging Wheel

LARGE SIZE DITCHER features a hydraulically driven conveyor that operates independently of the digging wheel and drive tracks. Digging wheel hoist and steering are also hydraulically driven. And, because the conveyor operates independently, the belt is not reversed when it is necessary to back up, (reverse the tracks), and no material is carried back into the digging wheel. If excessive caving is encountered, the digging wheel and drive tracks can be stopped and the conveyor will continue to operate and clear itself. Or, it is possible to operate the digging wheel and conveyor without the tracks. If conveyor is momentarily overloaded, it can be cleared by producing a rocking action. The Big Incher digs a trench 9 ft deep and 52 in. wide. A smaller model (Middle Incher) is contemplated.—UNIT RIG & EQUIPMENT CO., TRENCHER DIVISION, KENNEDY BLDG., TULSA 3, OKLA.



## Root Ripper

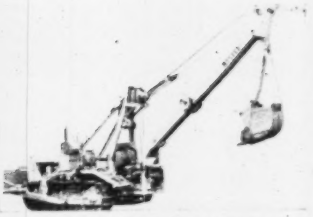
Companion piece to Baker line of bulldozers and Gradebuilders is designed for general land-clearing operations. It may be purchased as an interchangeable attachment for cable and hydraulic units, or as a complete machine. The attachment consists of nine teeth bolted to horizontal cross members. The teeth are curved to produce a rolling action so that dirt is shaken loose and filtered between the teeth.—BAKER MFG. CO., SPRINGFIELD, ILL.

## Brake Motor

DuClad motors are now equipped with Stearns magnetic brakes as unit apparatus. Recommended for use on cranes, hoists, and conveyors, the DuClad motors up to 20 hp, 900 lb-ft static torque have this explosion-proof electrically operated brake. A wear indicator tells when to make a screwdriver adjustment to compensate for wear. All brakes are totally enclosed. The brake is designed to hold even in the event of a power failure during operation.—GENERAL ELECTRIC CO., APPARATUS NEWS BUREAU, SCHENECTADY 5, N. Y.

## Portable Asphalt Plant

Continuous process central mix asphalt plant has rated capacity of 70 to 72 tons per hour. The Model 54 Continuflo consists of two main units and features port ability and all electric drive. No erection work is involved in setting up the plant—units are pulled or backed into place and are ready to go as soon as piping is attached. Either steam-atomizing or air-atomizing burner is available. The entire plant is electric driven with individual motors for each functioning unit.—PIONEER ENGINEERING WORKS, 1515 CENTRAL AVE., MINNEAPOLIS 13, MINN.



## Tractor-Mounted Excavator

Hyster D6 Hystaway, tractor-mounted ¾-yd excavator, can now be equipped with a hoe front. Complete tractor mobility and maneuverability are fully retained with the attachment in place. Utility use of dozer blade is maintained. Standard width of hoe dipper is 33 in.; but for narrow ditching requirements, a 23-in. dipper is available.—HYSTER CO., 2953 N. E. CLACKAMAS, PORTLAND 8, ORE.

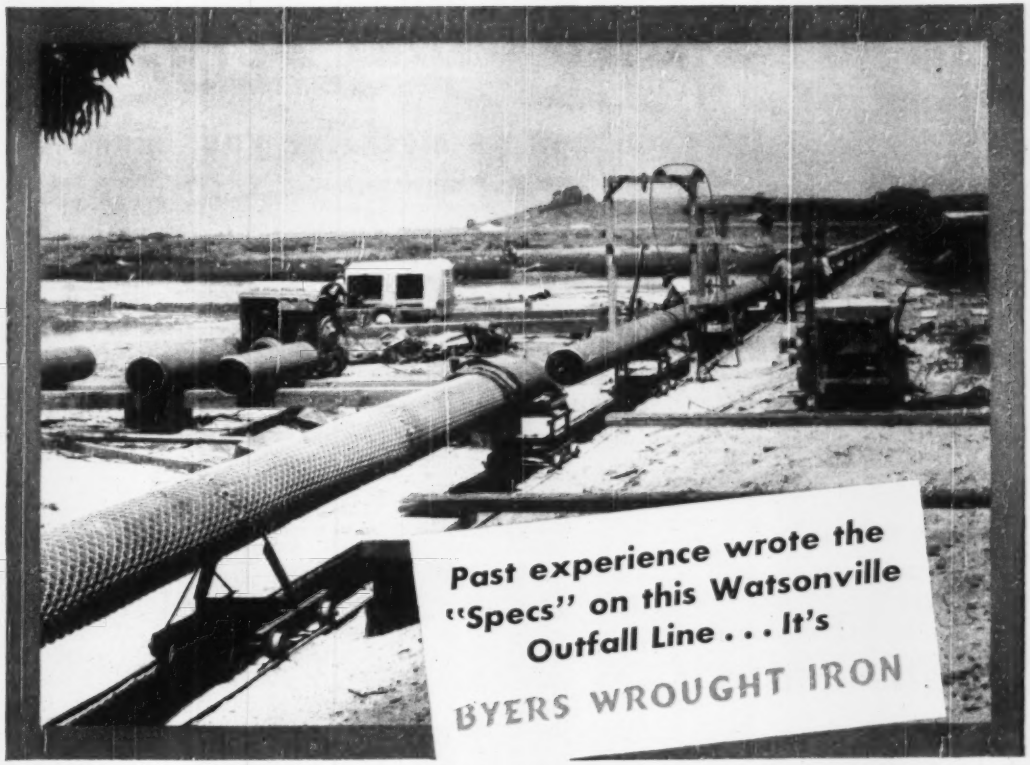
## Heavy-Duty Bucket Loader

Model P-11 (wheel mounted) and Model Q-11 (crawler mounted) loaders have a rated loading capacity of 3 to 4 cu yd per min with materials weighing up to 3,50 lb per ft. Both machines handle any loose material up to 3 in. cube, either from stock piles or bank-run sand-and-gravel pits.—N. P. NELSON IRON WORKS, INC., CLIFTON, N. J.

## Forced-Air Heating System

Forced warm-air heating and ventilating system features individual dual mixing chambers, or blenders, in place of conventional registers. The blenders have no moving parts and are operated entirely by force of air coming from furnace. This is said to set up a constant circulation and recirculation of air. The Blend-Air is provided as

(Continued on page 113)




When the city of Watsonville, Cal., made plans for a new sewage outfall line, the designers had the finest guide in writing specifications that anyone could ask: a previous outfall line, installed 25 years ago, and still in good condition.

With this to go on, the City Engineer, H. B. Kitchen, used 16-inch Byers Wrought Iron pipe. To aid in overcoming buoyancy, and to give extra protection against the abrasive action of shifting sands, the outermost 800 feet of the line was wrapped with steel mesh, and covered with gunited sand and cement. The next 600 feet was wrapped with steel mesh, inclosed with 8-gage steel casing, and the space filled with cement grout. As successive lengths were added by welding, the line was towed out to sea, riding on the small carriages shown in the illustration. The pipe was fabricated from ⅜ and ½-inch wrought iron plates by Pittsburgh-Des Moines Steel Company. Installation was handled by Granite Construction Company.

The use of wrought iron for outfall lines is wide-spread, and the reason is found in the excellent service records that the material has established. Wrought iron has an unusual structure, that makes it unusually effective against the corrosion encountered both from sea water, and from sewage. Tiny fibers of glass-like silicate slag, threaded through the body of high-purity metal, halt and disperse corrosive attack, and so discourage pitting. The fibers also anchor the initial protective scale, which shields the underlying metal.

Descriptions of several wrought iron outfall line installations are included in our bulletin WROUGHT IRON FOR SEWAGE TREATMENT AND DISPOSAL INSTALLATIONS. We will be glad to send a copy on request, and to provide added detailed information if you wish it.

A. M. Byers Co., Pittsburgh, Pa. Established 1864. Boston, New York, Philadelphia, Washington, Atlanta, Chicago, St. Louis, Houston, Salt Lake City, San Francisco. Export Division: New York, N. Y.

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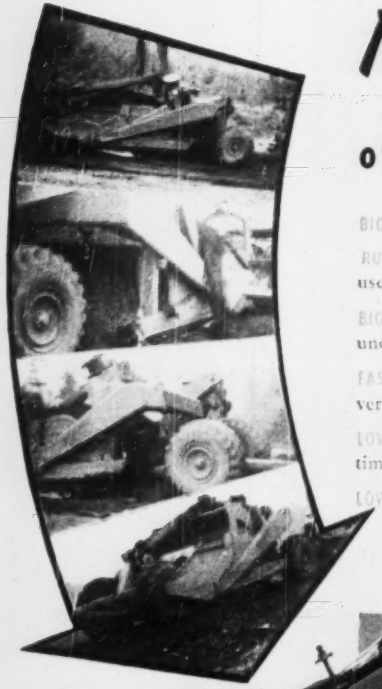

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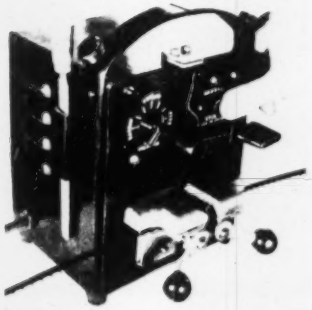
a completely factory-fabricated heating system, and employs 3½-in. ducts for distribution of the warm air. Furnace occupies 5 ft. of floor space.—The Coleman Co., Inc., Wichita 1, Kans.

### Hydraulic Pump

Hand-operated hydraulic pump is now available in small sizes. The Power-Packer, Jr., consists of pump, reservoir, and control valve. Capacities are: Model P-146, for systems with maximum pressures to 6,000 psi; Model P-147, for pressures to 5,000 psi; and Model P-148, for pressures to 2,500 psi.—Blackhawk Mfg. Co., Milwaukee 1, Wis.



### Saw-Blade Welder

Automatic saw-blade welder permits on-the-spot welding and annealing of saw blades up to 1.2 in. wide. Band-sawing machines equipped with this new welder permit internal sawing operations as the blade can be rewelded at the machine after threading through the work. All controls are clearly marked. Accurate alignment of blade ends is made possible by cam-operated jaws. Weld selector automatically provides correct spring tension to welding jaw. Thickness gage tests proper blade thickness at the weld.—DoAll Co., Des Plaines, Ill.

### All-Purpose Lubricant

Plastilube all-purpose lubricant is said to have no melting point. In addition to non-melting feature, Plastilube possesses high adhesive qualities, excellent pumpability at low temperatures, and high stability.—The Warren Refining & Chemical Co., 750 Prospect Ave., Cleveland 15, Ohio.

### Water Bracket

Safety and economy are features claimed for the Superior water bracket. This bracket is equipped with a slot for guard-rail uprights. All joints are welded, and a double hook and angle

(Continued on page 115)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Weldforged
TRADEMARK
STEEL GRATING
& STAIR TREADS

Continuous spiral cross bars, **alternating** right and left and slightly **above** bearing bars, **insure** greater non-skid protection. There are **no slick spots** in Kerrigan Weldforged grating. Write now for new 24-page catalog describing and illustrating many types of grating. One will fit your needs.

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More than a decade ago a large number of LimiTorque Controls were installed at the then new Sewage Disposal Plant of a western New York city. Many of these units were mounted outdoors where extremes in temperature and all weather conditions had to be encountered. The thorough design and precision of construction of the LimiTorques has been proven by the dependable performance of the controls since installation.

LimiTorque Valve Operators are the modern, economical and dependable way to open and close plug, cock, globe, gate and disc valves . . . by local and remote control. Just a "*push of the button*" sets them in operation.

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LimiTorque is actuated by any available power source . . . electricity, steam, water, gas, oil or air. They are available for all makes and types of valves, and are adaptable to existing equipment. Your valve maker can furnish LimiTorque.

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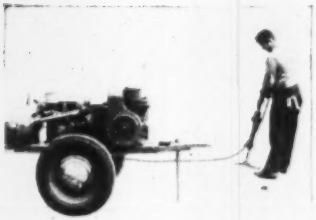
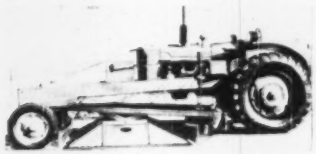
*Industrial Gears and Speed Reducers*
*LimiTorque Valve Controls*

heater eliminates swaying. A 2x4 extension pad may be slipped into the bottom pocket so that the unit can be attached to the bottom waler. — Superior Scaffolding Co., 5634 Bankfield Ave., Culver City, Calif.



**Portable Air Compressors**

Two new Blue Brute portable air compressors are available in hand truck and trailer models. These two-stage air-cooled compressors have a 50-ft capacity at 100-lb pressures, with a maximum operating pressure of 150 lb. Powered by a hand-cranked air-cooled gasoline engine, the compressors have patented feather valve, suction-valve unloading, and general design readily accessible for easy maintenance.—Worthington Pump & Machinery Corp., Construction Equipment Div., Holyoke, Mass.



**Asphalt Road Planer**

Clarkmoore asphalt road planer is designed for resurfacing and renovation of old asphalt or road pavements. The Model 31 is powered by a gasoline engine. Fuel-oil burner supplies intense heat to the heating hood area. This burner throws a flat or horizontal flame into the heating hood. Depth of cut of planning blades is controlled hydraulically. — Asphalt Maintenance Co., 41 Park Row, New York 7, N. Y.

**All-Purpose Snatch Blocks**

Lock-pin design of the LeBus snatch blocks does away with threaded bolts and nuts. Sheaves are designed to permit use of wire line or manila rope. These blocks are available in 4, 5, 6, 8, and 10-in. sizes.—LeBus Rotary Tool Works, Inc., Box 2352, Longview, Tex.

**Stakes for Concrete Forms**

Saber stakes are made from 1/4-in. round steel and are 48 in. in length. The forged steel point permits driving

(Continued on page 117)

RHOADS CONTRACTING CO., ASHLAND, PA., says . . . "excellent results experienced thru new Waukesha Diesel Engine, Model 6 WAKD in our Marion shovel. The performance has exceeded our expectations, with quite a saving in fuel and lube oil."
HICKORY CONTRACTING COMPANY, SHAMOKIN, PA., in speaking of conversion of their Marion Shovel to Waukesha Diesel Power, says: "The know-how of Auto Gear & Parts Co., Inc., engineers was really assuring."

**2 CONTRACTORS . . . . 2 SHOVELS . . .**

WAUKESHA Super-Duty DIESEL (Model 6 WAKD) six cylinders, 6¼-in. bore x 6½-in. stroke, 1197 cu. in. displacement, powers these Marion shovels.

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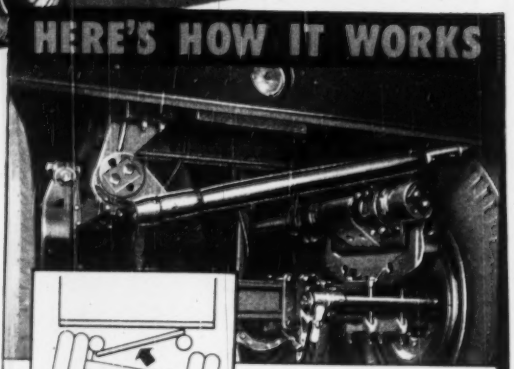

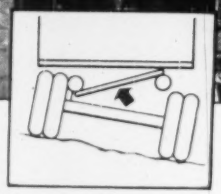

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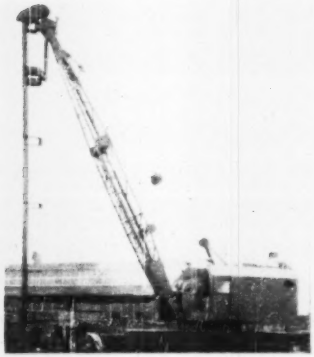
them into rock, hard frozen ground, macadam, or blacktop paving. A special feature is the 2x4 carrier located near the top. This carrier has a hole in the handle so that 2x4's can be spiked into a firm, solid position.—Rockford Bolt & Steel Co., Rockford, Ill.



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Self-contained, revolving locomotive type unit is a combination crane and pile driver. One unit, one power plant, and one crew perform the entire job of driving piles and setting caps and trusses at one spotting. Specifications and capacities are flexible for individual requirements.—Orton Crane & Shovel Co., 608 S. Dearborn St., Chicago 5, Ill.

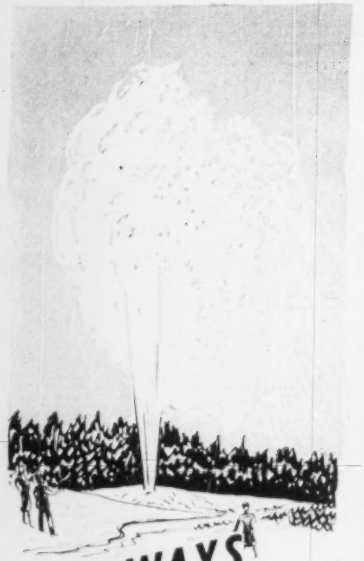
## New Product Briefs

**Automatic water system** is standard equipment on all new Worthington-Ransome 34E dual-drum pavers. The system is designed to simplify operation of the paver and to assure a more uniform mix. System goes into operation when skip is approximately 4 ft off the ground.

**Wall fin-type radiator** has easily installed cabinets in standard unit lengths that lock together with push-in rivets. Hanger is designed to ride with expansion and contraction of heating element. Manufactured by: The Trane Co., La Crosse, Wis.

**Portable hand lamp** has a 4-in. lamp-head, is powered by a standard 6-v lantern battery, and weighs 48 oz. Produced by: U.C. Life Mfg. Co., Chicago 22, Ill.

**Wood-study kit** contains 54 specimens of commercial species of wood and wood products. A 10-power hand lens, knife, and 84-p descriptive manual are included. Distributed by: Timber Engineering Co., Washington 5, D. C.



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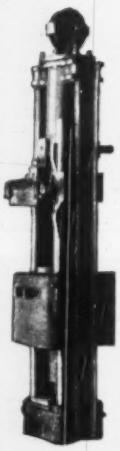

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# MANUFACTURERS' PUBLICATIONS

**Chlorine Treatment of Water**—Processes and equipment for chlorine treatment of municipal water are discussed in this bulletin. Flow diagrams and illustrations contained in the bulletin describe use and advantages of process instrumentation in municipal water treatment.—FISCHER & PORTER CO., HATBORO, PA.

**Flexible Tubing**—Specifications, application data, engineering tables, sizes, and other descriptive matter on Spiratube flexible tubing are contained in Catalog 5-4. Features of Spiratube discussed in detail in the catalog include wear and heat resistance, portability, retractability, and ease of assembly.—THE FLEXIBLE TUBING CORP., BRANFORD, CONN.

**Warm-Air Panel Heating**—The Flexicore split system of warm-air panel heating is described in a new folder. This system features the use of Flexicore structural floor members as both warm-air ducts and as a panel heating unit. The folder features large drawings indicating complete installation and flow path of warm air through the Flexicore units.—THE FLEXICORE CO., 1952 E. MONUMENT AVE., DAYTON 1, OHIO.

**Welding Fittings, Steel Flanges**—Seamless carbon-steel welding fittings and forged-steel flanges are described in this 88-p catalog. In addition to presenting standard schedules with specifications, list prices, and sizes, the catalog provides data on dimensional tolerances, American standard flange facings, thread standards and practices, and other important data. The catalog also lists dimensions of welding fittings stocked in metals other than carbon steel.—GRINNELL CO., INC., PROVIDENCE 1, R. I.

**Tractor-Drawn Scraper**—Broadside describes the Model 625 scraper designed for use in conjunction with the Allis-Chalmers HD-19 tractor. Cutaway drawings are used to illustrate loading, carrying, and dumping and spreading functions; sectional views illustrate principal components of the 625; and photographs show the scraper at work on all types of earth-moving jobs.—GAR WOOD INDUSTRIES, INC., ENDEAY DIVISION, ENDEAY, OHIO.

**Compressor Wagon Drills**—Two bulletins are now available describing Blue Brute construction equipment. Bulletin H-1200-B30-A describes three models of the Worthington wagon drills—UMW-40, UMW-35, and UMW-30. Bulletin H-850-B71 describes a contractors' model 600 ft portable compressor.—WORTHINGTON PUMP & MACHINERY CORP., CONSTRUCTION EQUIPMENT SALES DIVISION, HOLYOKE, MASS.

**Diesel Motor Grader**—Heavy-duty diesel-powered road-building unit with hydromechanical controls is described in Bulletin G-159. Important features of the Huber motor grader are described, principal dimensions are listed, and specifications are included for the two power units available. Bulletin G-159 is 12 pages in length.—HUBER MFG. CO., MARION, OHIO.

**Tubular-Steel Scaffolding**—Eight page catalog carries illustrations of a complete line of tubular-steel scaffolding and equipment. Included are drawings and complete specifications on various types of end frames for tower scaffolding and a broad range of accessories, including ladders, ladder-jacks, scaffold brackets, sidewalk bridges, and plasterer's scaffolding. Photographs of several installations are included.—BIL-JAX, INC., ARCHBOLD, OHIO.

**Calcium Chloride**—Use of calcium chloride for surface consolidated roads is subject of a two-page condensed report. This report describes proper maintenance procedures for reshaping gravel roads, adding new materials, and applying calcium chloride.—CALCIUM CHLORIDE ASSN., 1200 EIGHTEENTH ST., N. W., WASHINGTON 6, D. C.

**Membrane Curing Compounds**—Twelve advantages claimed for Permite concrete-curing compounds are listed in this 4-p bulletin. When sprayed onto a concrete surface, Permite is said to form an impervious film which seals in mixing water for proper curing. The bulletin describes two types of Permite—one for horizontal surfaces and vertical surfaces below grade, the other for surfaces where non-discoloration is an important factor.—ALUMINUM INDUSTRIES, INC., 2458 BERKMAN ST., CINCINNATI 25, OHIO.

**Structural Steel**—Factual information on structural steel is interestingly presented in this 64-p booklet. The booklet tells what structural steel is, describes the shapes in which it is available and lists its advantages and physical properties. The booklet contains a section on steel fabrication

listing several types of structures built of steel. Also listed are winners of the AISC annual bridge awards. The booklet is thoroughly illustrated with large, interesting photographs of steel structures both in the construction stage, and as finished products.—American Institute of Steel Construction, Inc., 101 Park Ave., New York 17, N. Y.

**Paving Materials Manual**—The first portion of this 50-p manual describes operations and pavement types in which Tarvia road tar and Tarvia-Lithic bituminous concrete are used. Methods of construction are described in general terms. Second portion describes manner in which Barrett paving materials may be utilized in the repair and maintenance of various types of pavement.—The Barrett Division, Allied Chemical & Dye Corp., 40 Rector St., New York 6, N. Y.

**Powered Wheelbarrow**—Bulletin describing the improved Moto-Bug emphasizes the newly added hydraulic lift attachment. This fork-lift feature increases the unit's usefulness in special handling problems. Numerous photographs illustrate additional improvements and developments made on the Moto-Bug. A full page is devoted to a series of photographs showing the unit in various applications with different types of front-end attachments.—Kwik Mix Co.; Subs. of Koehring Co., Port Washington, Wis.

**Centrifugal Pumps**—Four-page flier describes the LR cradle-mounted centrifugal pumps. The bulletin shows a sectional view of the pump with all its salient features pointed out and described. In addition, various types of drives are illustrated. The bulletin describes five models ranging in capacity from 2 to 5 in. discharge with capacities to 1,600 gpm and heads to 250 ft.—Ingersoll-Rand Co., 11 Broadway, New York 4, N. Y.

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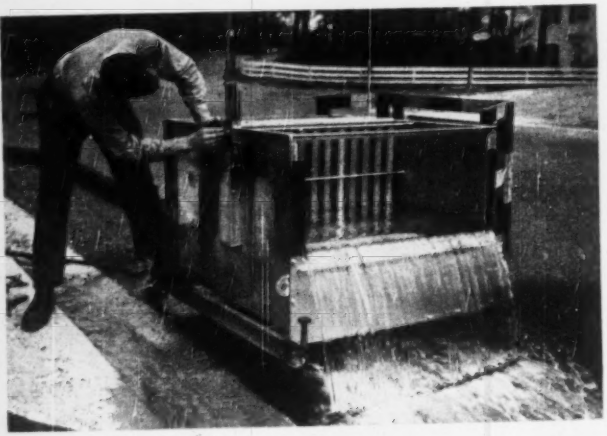


## What clogs the drains?

Sober Baltimore citizens who may be startled this summer by groups of young men tossing ping-pong balls, leaves and rubbish into curbside gutters needn't write off the sight as college antics—or notify their nearest police precinct to come a-running.

The young men will be college students all right—from Johns Hopkins University's Institute for Cooperative Research to be exact. But their purpose will be entirely serious.

They'll be looking for an answer to a problem that faces every municipal engineer: What, exactly, makes storm sewers clog under the thrash of heavy summer and fall rains?

Effective street drainage is something of a paradox. The rules for building drainage structures are strictly rule-of-thumb. And many an apparently ample inlet clogs almost immediately; many another simply doesn't take off the water, many inadequate ones get too much.

• **Research to the rescue**—So, under the leadership of John C. Geyer, professor of Sanitary Engineering at Johns Hopkins, a group is confidently trying to find the answers to storm-water removal problems.

The program is a full-coverage operation. Flows into adjustable street-inlet models are being studied in the laboratory, inlets in the field are investigated for conditions not reproducible in the lab; and rainfall and runoff over a wide area are to be measured simultaneously during storms. The study of rainfall and runoff combined, it should be pointed out, is fairly new and difficult to effect.

A hydraulic model, which has been set up in the hydraulics laboratory of the university's civil engineering department, has both adjustable gutter and cross-street slopes. It's about 20 ft long and 5 ft wide and designed so that several types of model inlets can be installed readily for testing under various discharges, slopes, deflectors and depressions.

Water from the recirculating system is delivered to the upstream end of the model by a 200-gpm electric pump. It then flows over the street model and to the curb or gutter inlet being tested.

• **In the field**—Tests of actual street inlets check model results.

To make these tests, the engineers and city employees flood gutters from fire hydrants. Then they drop leaves and trash into the flooded gutters in a serious effort to learn what makes inlets clog. Along with this, they're employing a number of methods both physical and chemical to measure the amount of water an inlet will take under various operating conditions.

• **Rainfall and runoff**—A major portion of the project is the study of summer thunderstorms, squalls and cloudbursts and the flows in gutters and sewers resulting from these storms.

Rain-gaging systems have been set up in selected areas to learn when and where and how fast the rain comes. The areas vary in size from six to twenty city blocks.

Gutter and sewer gages are in place to keep track of the water during its passage over the surface, down the drain and out of the test areas. With such extensive measurement, Dr. Geyer says that the system should provide a check on present design methods. Perhaps, it will result in the development of new and better ones, he adds.

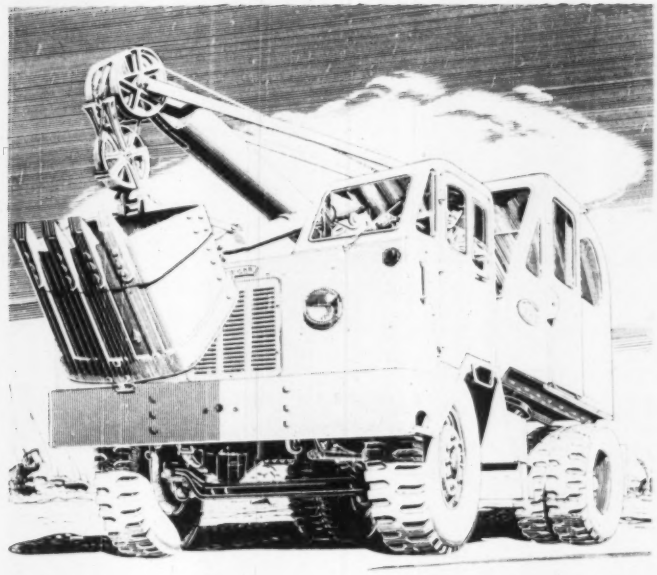
The whole system is planned so that it should function automatically. If none of the research team were in the area, the desired information can be taken off the various recording charts.

• **Project aims**—Pointing out that engineers now employ broad assumptions to calculate a sewer's capacity during rainfall, Geyer explains that the project also calls for a study of the storage capacity of a sewer, condition of the ground surface, types of roofs and how fast they drain plus many other contributing factors.

The research—to cost $50,000—was preceded by a postcard survey to 150 cities and state highway departments so that all findings thus far might be taken into account.

The project is sponsored jointly by the Baltimore Municipal Department of Public Works, the Baltimore County Metropolitan District and the Maryland State Roads Commission. The Storm Drainage Research Committee represents the sponsors. It includes: B. L. Sidwell, bureau of sewers, Baltimore, chairman; V. J. Haddaway of the BCMD; William Staylor, bureau of sewers; W. C. Hopkins and C. A. Goldeisen, MSRC and L. S. Cassedy of Whitman, Requardt and Associates, consulting engineers.

The Institute for Cooperative Research personnel, who work closely with the sponsor's committee, include in addition to Dr. Geyer, Dr. G. S. Benton, assistant professor of civil engineering; B. C. Goodell, Dr. Wen Hsiung and Edmund Schiemer, research associates; Norman Jackson, Knut Sotelsig, Ralph von Hohenleiten and George Lewis, research assistants.



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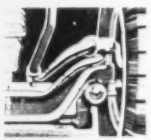

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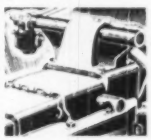
Heavy duty worm and roller steering gear; 20-inch steering wheel, minimize steering fatigue and help you thread through traffic easier, get around on the job faster.



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Smooth meshing gears, no "fighting" the shift-lever or clutch pedal. Auxilliary transmission provides multiple speed range for every highway condition, for tough off the road truxel.

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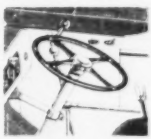
Big, traction-tread tires easily pull you through deep sand, mud or heavy snow without delays. Their high-flotation takes you over soft ground with far less chance of bogging down.



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Operators like it! Plenty of leg and elbow room for big men. Wide angle visibility through big, rubber-set windshield and windows. Familiar, automotive type controls.

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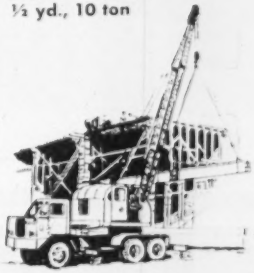
**⅜ yd., 6 ton**

**Model TMDT-16**
**½ yd., 10 ton**



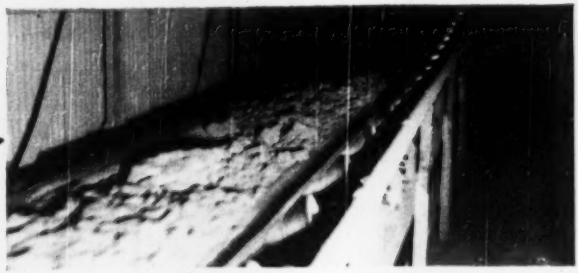
**Model TLDT-20**
**12 ton**

**Series 8**
**½ yd., 8 ton**

**Model C-16**
**½ yd., 8 ton**

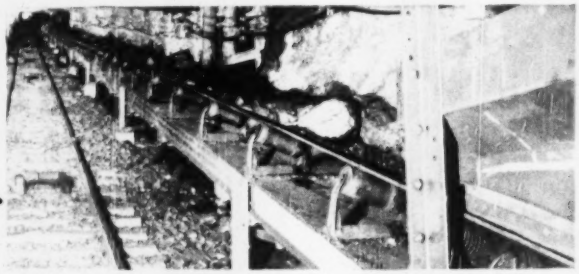
# FOR HEAVY DUTY CONVEYORS . . .

## IT'S TIMKEN®...



For over a quarter of a century, Timken® tapered roller bearings have given long, trouble-free service in heavy duty conveyors—just as they have throughout all industry. A typical example is this conveyor that handles 1 million tons of ore per year—about one-third of the Cuyuna range output! With Timken bearing equipped Stephens-Adamson Company idlers, this installation assures a steady flow of iron ore from the pit.

## AND TIMKEN...



Timken bearing equipped Rex idlers speed up the job of bringing coal to the pit head in this mine installation. Timken bearings have unusual load-carrying capacity—take radial and thrust loads in any combination. Idler friction is practically eliminated. Belt wear is reduced. And Timken bearings permit tighter closures to keep lubricant in, dirt and moisture out. Maintenance is reduced to a minimum.

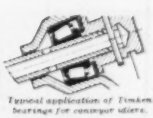
## AND TIMKEN AGAIN!

Here's one of the four conveyors at the Blue Ridge Stone Company's quarry at Roanoke, Virginia. Using a total of 8,566 Timken bearings in troughing idlers and return rolls made by Barber-Greene Company, the system is 8,795 feet long. Thousands of miles of conveyors are now equipped with Timken bearings. The reason: *There's no other bearing with so much to offer—no other bearing so fully proved!* The Timken Roller Bearing Company, Canton 6, Ohio. Cable address: "TIMROSCO".

*Wherever the going's tough industry turns to*

**TIMKEN**

***TAPERED ROLLER BEARINGS***



*Typical application of Timken bearings for conveyor idlers.*

**NOT JUST A BALL NOT JUST A ROLLER THE TIMKEN TAPERED ROLLER BEARING TAKES RADIAL AND THRUST LOADS OR ANY COMBINATION**